THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

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Multiuser net software gaining market foothold

By Eric Bender
CW Staff

Multiuser application software that shares data across a personal computer local-area network is just hitting the market, with fewer than 30 such packages now available, by most estimates.

The software will remove a major stumbling block for local-area nets, experts said. "About all you can do in a local-area network is to share disk space and peripherals," commented Stephen Caswell, a consultant with Trigon Systems Group in Toronto. "It's extremely disappointing."

Tyrone Pike, president of LAN Systems, Inc. in New York, added, "We're just coming into the beginning of commercial-grade multiuser net products. A number of tools have been developed that can be used for vertical market applications, but these have not resulted in mass-market products."

The leading mass-market contender is the multiuser Dbase II offered by Ashton-Tate of Culver City, Calif., shipped last spring in a version for the Etherseries nets sold by 3Com Corp. of San Jose, Calif. Ashton-Tate intends to sell network versions of its new Dbase III as well, although no schedule has been announced.

Most other products come from lesser known vendors such as Software Connections, Inc. of Santa Clara, Calif., which claims its

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IEEE starts search for Unix-like standard

By Eric Bender
CW Staff

The Institute of Electrical and Electronics Engineers is chartering a committee to address the need for a Unix-compatible operating system standard.

The IEEE's P1003 Working Group on Operating System Kernel Standards (Unix) will attempt to reduce the complications resulting from numerous Unix versions, according to Committee Chairman Jim Isaak, product marketing manager at Charles River Data Systems, Inc. of Framingham, Mass.

AT&T, which owns and develops Unix, claims that Unix System V has become a standard. But currently, "There is no agreement on what a standard Unix looks like," Isaak said. As one example, he noted that AT&T's Real-Time-Reliable operating system, running on the firm's 3B20 computers, is incompatible with other AT&T operating software. In this case, "AT&T's own System V is not compatible with AT&T System V.

"You want a standard you can build on," he said. "It must be soon enough and pragmatic enough that people actually use it."

Stephen Scherman of the University of Nevada at Las Vegas, chairman of the IEEE Computer Society's Technical Committee on Operating Systems, said, "It's to everyone's benefit to produce a standard. We feel it's time to fill that gap."

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TOP OF THE NEWS

The European Economic Community has ended its four-year-old antitrust investigation of IBM. **Page 2.**

■

Fit for commercial use? That's the question being pondered by experts regarding Ada. **Page 4.**

■

Keyed up. IBM has replaced its widely criticized chiclet keyboard on the PCjr and has added memory modules that give the machine the power of its low-end Personal Computer brethren. **Page 6.**

■

Twenty thousand workers at 1,250 sites across the U.S. are being trained in computer skills on a network brought online at Metropolitan Life Insurance Co. **Page 8.**

■

An 18-month office automation project has resulted in the installation of a user-friendly IBM Personal Computer XT-based system in the White House to handle a myriad of scheduling, budgeting and correspondence chores. **Page 10.**

■

Mostly peachy. A beta site user of Peachtree Software, Inc.'s Decision Manager package found the software performed well overall and gave especially high marks to its graphics capabilities. **Page 11.**

■

An application generator for IBM mainframes, said to produce complete software systems as well as specific programs, has been introduced by Leading Software Technologies Corp. **Page 43.**

■

The president of Compaq Computer Corp. claimed in an interview that the feisty micro maker has shipped more 16-bit, IBM-compatible machines than any other company and intends to maintain its position. **Page 59.**

FYI

Videotex system puts LA at Olympics visitors' fingertips

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — After a long but exciting day of spectating at the Summer Olympics, a ravenous tourist stalks out of the Los Angeles Coliseum in search of his evening meal.

Visions of pasta and veal parmigiana, with its gooey, melted cheese and thickly ladled marinara, assault his thoughts as he approaches a multicolored display screen in a nearby department store.

Eagerly, he extends a finger and makes contact with the screen's touch-sensitive surface. In a flash, a menu of about a dozen broad topic headings materializes before his eyes. Scanning the list, he spies a heading labeled "Restaurants" and points to it. As if by magic, the menu suddenly vanishes. In its place appears a

question: Which variety of ethnic cuisine — French, Chinese, Mexican, Italian and so forth — does the diner prefer? A lengthy list of culinary options immediately follows. As his stomach rumbles with hunger, he studies the list intently and then touches the part of the screen displaying the word "Italian."

For an instant, the screen goes blank. Then it comes alive again with a catalog of Greater Los Angeles communities and districts. Above this second menu lies a line of text asking the user in which locale he wishes to dine. After he again indicates his preference by touching the appropriate heading, the system searches its memory for the name of every Italian restaurant in the community he has just selected.

The system then summons each name to its display screen to form a directory, complete with each eatery's address, phone number and profile. For a few seconds, he scrutinizes the list before pointing to his choice. With another touch of the screen, he then automatically dials the desired restaurant and calls in his reservation through a built-in telephone.

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NEWSPAPER

NEWS

EEC suspends antitrust case; IBM seen victorious

By Tom Henkel
CW Staff

BRUSSELS — IBM scored what analysts termed a major victory last week in its four-year antitrust battle with the European Economic Community (EEC). The EEC suspended its antitrust investigation after IBM agreed to make voluntary alterations in its European marketing practices.

Most industry watchers contacted last week agreed that those modifications would have little, if any, impact on the way IBM does business in Europe.

The two major highlights of IBM's voluntary action are:

■ IBM agreed to make available technical, or interface, specifications on all new products that employ an IBM 370 architecture within four months after those products have been announced in Europe.

IBM will also make those technical specifications available if new 370-era products are delivered to end users sooner than four months after announcement. An IBM spokesman noted that those first end-user deliveries do not include early customer deliveries, typically known as beta sites, which install new products primarily for the purpose of field testing.

■ IBM also agreed to drop a requirement that European users of IBM mainframes purchase bundled, or predetermined amounts of, main memory. IBM will now deliver, at the customer's option, systems without main memory or systems configured with the minimum main memory required for system testing, IBM said.

Under the agreement, IBM technical specifications that involve linking IBM CPUs or multifunction hardware items to other pieces of hardware will be made generally available within 120 days of the announcement. Likewise, product announcements that link CPUs and software products will also be made available in 120 days.

Specifications involving products designed to connect IBM software products or involving enhancements to IBM's Systems Network Architecture will be made available when the formats and protocols for those products are considered stable or generally available. An IBM spokesman said the agreement reached with the EEC did not specify who would decide when such products were stable.

The IBM spokesman said the voluntary agreement applies only to products that employ an IBM 370 architecture. This, he said, includes newer IBM mainframes such as the 3083, 3081, 3084 and 4300 series machines.

The agreement will remain in effect until Jan. 1, 1990, but the IBM spokesman declined comment on whether the agreement will apply to future IBM mainframes if they employ architectures that depart from the traditional 370-era products.

The spokesman also noted that the agreement does not apply to products that do not currently employ a 370 architecture. These include System/38, the 8100 distributed processing system, System/36 and IBM's popular Personal Computer line of microcomputers.

Industry analysts called the compromise a major victory for IBM and a graceful surrender by the EEC.

Noting that IBM already delivers most of its new mainframe products within six months of an announcement, William Easterbrook, an IBM watcher with the New York firm of Kidder, Peabody & Co., said the four-month requirement will do little to IBM's current business strategies.

As for the main memory agreement, Easterbrook noted that the declining cost of main memory has, by default, made the issue a moot point.

"Like everyone else who ever sued IBM, they [the EEC] were in over their heads," noted Stephen T. McClellan, a vice-president with New York-based Salomon Brothers, Inc. McClellan added that since the EEC investigation dragged on for four years, many of the original issues, such as the main memory bundling question, resolved themselves prior to the formal resolution of the case.

"The EEC just seemed to cave in," Easterbrook said, noting that pressure from European users and the possibility that a tough ruling against IBM would only bolster Japanese mainframe vendors' position in Europe may have forced the EEC to soften its stance in the case.

Easterbrook noted, however, that by suspending the case, the EEC appears to have reserved the right to reopen the antitrust issue if IBM gets out of hand between now and 1990.

Rodger Dale, head of the IBM Computer Users Association, a British IBM users group, called the EEC accord "a reasonable compromise," which will cause European IBM users to breathe a sigh of relief.

Contributing to this account were Ron Condon, editor of Computer News *(London), and Bert Lubbers, senior writer of* Computerworld Benelux *(Amsterdam).*

CAB rule targets reservation system bias

WASHINGTON, D.C. — The Civil Aeronautics Board (CAB) last week approved a final rule that is designed to eliminate bias in the computerized reservation systems provided by airlines to travel agents.

The rule prohibits the airlines that own the reservation systems from biasing the on-screen displays of travel information against competitors' flights.

Smaller airlines and the Department of Justice had charged that the dominant reservation systems — United Airlines' Apollo system and American Airlines' Sabre system — gave prominence to the providers' own flight schedules [CW, Feb. 20].

The final rule requires that airline-owned computer reservation systems have at least one display that shows the schedules, fares, rules and availability of all airlines in an unbiased way, according to a spokesman.

In addition, the rule prohibits vendors from making it too difficult or time-consuming for travel agents to view the unbiased display.

The CAB itself is scheduled to be terminated at the end of this year, and Congress is expected to transfer the board's consumer-protection rule to the Department of Transportation.

CORRECTIONS

Consultant Gil Gordon was incorrectly quoted in an article on telecommuting in the July 16 issue of *Computerworld* as saying a typical metropolitan area company will spend $40,000 to $60,000 per year per employee for office space. These figures should have read $4,000 to $6,000 per year per employee.

Computer consultant Naomi Karten's address is 40 Woodland Pkwy., Randolph, Mass. 02368. It was incorrectly listed in the July 16 issue of *Computerworld.*

Ilink was mistakenly reported to be a product from Information Software [CW, July 23]. The product's vendor is Infocenter Software, located in New York.

NEWS SUMMARY

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IBM has announced enhancements for its PCjr that address the low-end micro's most criticized limitations/**6**

Metropolitan Life Insurance Co. workers are being trained on the company's recently acquired minicomputer-based network as part of a training program instituted last year/**8**

Top-level White House aides are now using IBM Personal Computer XTs to handle presidential scheduling, correspondence, budget and research chores/**10**

Peachtree Software, Inc.'s Decision Manager integrated package received mixed reviews from one of its beta test sites/**11**

A U.S. District Court judge recently rebuffed efforts by the divested Bell operating companies to offer certain competitive services and to enter other businesses/**12**

Hewlett-Packard Co. and Amdahl Corp. ranked tops and Prime Computer, Inc. lowest in a recent survey of user satisfaction levels in DP shops/**13**

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A former football star has found that the microcomputer handling his restaurant's books can also keep track of his fans/**19**

An electronic noise-reduction systems manufacturer has found a way to streamline document production/**22**

A graphics plotter has become as important to one Texas surveyor's work as his surveying instruments/**23**

An Indiana bank keeps customers informed of rates and offerings with a micro-based video system/**24**

Northwest Orient Airlines realized increased productivity by replacing its manual crew scheduling system with an interactive system/**26**

An electronics supplier has reportedly cut its product development time in half by turning to a data base machine to streamline manufacturing and inventory data available to its computer-aided design systems/**28**

An automatic diskette processor has solved a nagging micro software distribution problem for one Big Eight accounting firm/**29**

Aggressive inventory control using micro software resulted in an "outstanding profit picture" for a small specialty clothing store chain in Louisiana/**30**

A motel chain's conversion to an automated reservation system was made smoother by matching software to the flow of taking reservations/**31**

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NEWS

Military future bright, but Ada's commercial role cloudy

By John Gallant
CW Staff

HYANNIS, Mass. — While its future within the military community seems bright, even supporters of Ada are uncertain about the role that the programming language will play in the business world in the next decade.

"Ada would certainly be useful in traditional data processing applications. It is a very strong, general-purpose language that allows you to create applications more complex than those that could be developed with Cobol or Pascal. Also, since it incorporates features such as modularization, it could be a vehicle for introducing modern programming techniques to that environment," Paul Hilfinger said.

Hilfinger was one of a panel of Ada experts interviewed by *Computerworld* at the Association for Computing Machinery's (ACM) Special Interest Group on Ada (Sigada) conference here last week. An assistant professor of computer science at the University of California at Berkeley, he lectures on programming language design and compiler implementation.

Hilfinger's involvement with Ada began in 1978, when he participated in the review of the final four design proposals in the U.S. Department of Defense's (DOD) Ada development competition. He was also involved in the development of the so-called Tartan language, which he described as an alternative to the proposals generated by the DOD runoff.

In addition, he held the position of distinguished reviewer during the last stages of Ada's design. Despite his long involvement with the language, Hilfinger expressed reservations about its acceptance beyond the military.

'A language is only part of the solution to the software crisis. Ada is just another language. The philosophy behind Ada is more important than the language itself.'
— Paul Hilfinger, assistant professor of computer science.

"I am not certain that businesses will be willing to invest in Ada, at least not in the near future," Hilfinger said. "On the basis of economics alone, it would not make sense to switch from an established language like Cobol to one for which working compilers are still in the development stage. Companies need a programming environment with few uncertainties. There is no reason to put the smoothing out of Ada's problems in their way."

Hilfinger said Ada would be useful for DP shops facing the problem of rapidly increasing maintenance requirements and looking to develop applications that could easily be transported to different machine types. But Hilfinger added that Ada is simply one approach.

"A language is only part of the solution to the software crisis," Hilfinger said, "and Ada is just another language. The philosophy behind Ada, the principles it encompasses, are more important than the language itself. I would like to see Ada prosper outside the DOD, but it is more important that these modern programming techniques get out there in any form."

Comments echoed

Hilfinger's comments were echoed by Anthony Gargaro, lead scientist for Computer Sciences Corp. (CSC). He also was involved in the design of Ada and the Ada Programming Support Environment. Because CSC is a major independent supplier of software to the DOD, the firm has what Gargaro labeled "a significant interest" in the success of Ada. But Gargaro also expressed doubts about the language's future.

"I think in some sectors of the industrial community, especially where embedded systems are involved, Ada will be adopted. But I do not think it will be greatly utilized for traditional commercial applications. Cobol is simply too entrenched to be replaced. Cobol does a fairly good job with the machine types available now, and I do not think many companies will be able to justify a conversion to Ada," Gargaro said.

Gargaro called Ada an advanced third-generation language that embodies "all that the software community has learned about programming in the last 25 years." But he cautioned that predictions of Ada's future dominance over other languages may be overly optimistic.

"There are some who say Ada will replace all languages. I think that is idealistic. There is nothing really new or innovative about Ada. It is certainly not a fifth-generation language. The DOD needed a language like Ada because its applications are more complex, and Cobol was not sufficient. But it seems clear that Cobol is useful enough for most business applications today," he said.

As vice-president and technical director of Alsys, Inc., Dr. Benjamin Brosgol also has an interest in the commercial success of Ada. Brosgol was a design team leader during the DOD's Ada development project, and his company was founded to bring Ada-based products to the marketplace. Alsys and a variety of other companies are working to design DOD-approved Ada compilers, a task that has thus far proved a stumbling block to the implementation of the language.

"The problems that prompted the DOD to push for Ada, such as the proliferation of languages and the need for portability across machines, are also facing the business community. Ada's main features, its reliability and its ease of maintenance, make it a good language for developing reliable commercial applications also. It is starting to move into the business world already, and the availability of good compilers on popular machines will set off a snowball effect," Brosgol said.

Brosgol said such compilers will be available as early as the end of this year. He predicted that the first firms to move to Ada will be those that develop systems both for the DOD and for outside business enterprises. He added that companies will also begin to recognize what he labeled a little-known, but very important, feature of Ada — its ability to draw on applications written in other languages.

"It is not a well-publicized part of Ada, but in practice, it will be one of the most important features," he said.

Brosgol foresaw a bright future for the DOD's offspring. "By the end of the decade, it will be one of the major languages in use."

But he agreed that Ada's implementation outside the defense community may be hindered by a shortage of personnel skilled in the use of the language.

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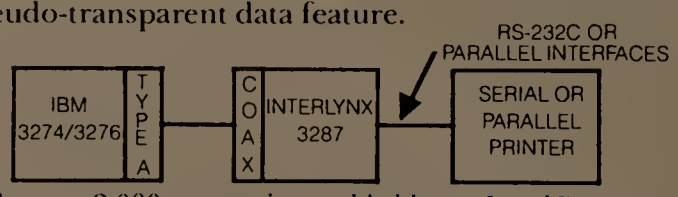

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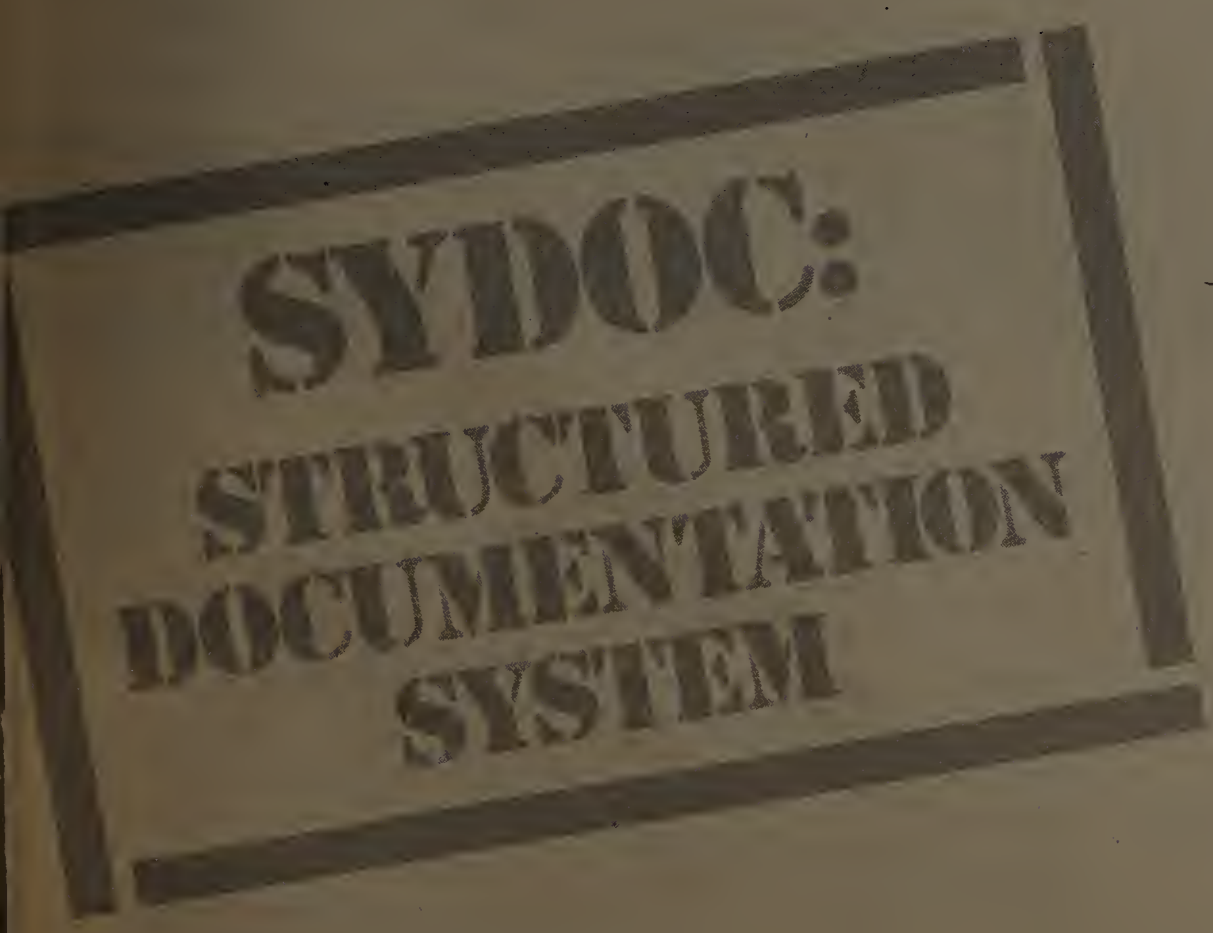

In keeping with our tradition of printing "all the DP news that fits," we present *Six Unexpurgated Facts About COBOL Maintenance and Documentation:*

1. Very few programmers—male of female—have ever established a meaningful relationship with documentation. What they produce is seldom very good—and it's almost never updated.

2. The result is a generation that might be called "Orphan COBOL Programs." They may have fathers. And they may have mothers. But birth certificates they have not got!

3. The rub comes when you try to update these orphans to meet the demands of the brave new world of DP. You can try to deduce the logic of such orphans by referring to the source code. But that's a slow and dangerous business. And your name had better be Sherlock Holmes.

4. Or you can simply ask the author of the program about the underlying logic. But guess what? He or she has just left for an exciting new job in Tahiti.

5. What you're probably left with is hand-drawn hierarchical charts—a long bus ride from structured programming techniques. And if you try to insert new code without understanding the logic, watch out. You'll probably introduce so many bugs you'll never be free of the exterminator!

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NEWS

Micro package makers shy from net versions

By Eric Bender
CW Staff

Local-area network manufacturers admit that personal computer software designed for network operation is still, by far, the exception rather than the rule, because until now mainstream software vendors have seen little reason to write network versions.

Several years after introducing its Omninet, Corvus Systems, Inc. of San Jose, Calif., is finally seeing numerous application software vendors writing network programs, according to Robert Wohnoutka, director of software development. "But it will be a long time before we get network versions of [Micropro International Corp.'s] Wordstar or [Lotus Development Corp.'s] 1-2-3," Wohnoutka said.

Software protection problems are one main stumbling block for most large micro software firms, Wohnoutka and other observers agreed. Each net supplier offers various schemes designed to avoid software piracy (such as requiring packages to check that the micro has the proper network address before running), but many software vendors remain nervous about the risks.

Another major limitation comes in pricing, according to John King of James Martin Associates in Carmel, Calif. "The major players are not pushing nets because it's not in their best interest," King said. "In the long term, what you're going to see is shared software, and right now people who sell Wordstar or 1-2-3 are still targeting the single user at a fairly high price."

"Suppose everything were networked, with an average of five users per network," Buck Gee, president of Software Connections, Inc., suggested. "You'd divide Lotus' revenue by five. It's not a viable thing for Lotus to look at."

This problem, however, apparently does not worry Ashton-Tate. The firm is offering its multiuser Dbase II at $995 for a four-user system, with expansion in four-user upgrades, each priced at $295.

In addition to cost concerns, many software publishers would rather not tangle with the development issues raised in multiuser operation, others observed. And suppliers are cautious about dedicating research and development resources as long as networks represent a small and fragmented slice of the personal computer market.

Vendors like Lotus "have to see a double-digit share of market moving toward nets" before planning to introduce net products, according to Tyrone Pike, president of LAN Systems, Inc. in New York.

"The No. 1s are taking a stick-your-head-in-the-sand approach," grumbled Harry Saal, founder of Nestar Systems, Inc. in Palo Alto, Calif. "They feel they don't have to innovate any more." Meanwhile, many hardware vendors are writing "big checks to make their software available on obsolete machines that aren't going anywhere," he said.

In one effort to break through the application software barrier, Nestar recently began bundling in five application packages with its Plan 4000 and 3000 nets. Nestar's Planpak takes care of copy protection and pricing arrangements, deals with any minor software glitches and preinstalls the applications, according to Saal. "Those are simple steps," he acknowledged, but they remove many customer worries.

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LAN:Datastore was the first relational data base management system designed specifically for local-area networks.

These new packages address the limitations of off-the-shelf, stand-alone personal computer application packages, which historically have run with varied success on networks.

For many jobs, such as spreadsheet calculations, single-user software is adequate because users generally do not share their files, according to Harry Saal, founder of Nestar Systems, Inc. of Palo Alto, Calif. "Typically, people will share data only on a read-only basis, and they do all of their writing to a private area that no one else is using," Saal said.

Problems are likely to arise in data base and accounting applications, however, because many workers may want to work simultaneously on the same or related files (for example, accounts payable and accounts receivable, each linked to general ledger).

These conflicts may be handled by the network system software, if it has been set up that way, or by the application package, if the package is designed for multiuser operation. But often the conflicts are not handled at all, and disaster occurs.

"There are certain applications, like word processing, that can be set up on a net so they don't conflict, but others end up eating the user alive," said William Driscoll, vice-president of Small Business Systems Group, Inc. in Westford, Mass. "Anything can get you in trouble unless it says multiuser on the box. If the application doesn't get you, the operating system will."

Users can avoid these problems by carefully training their workers to coordinate their activities, a requirement that slows network sales, Driscoll pointed out. "Why buy it if you can't get access to shared data?"

And despite all training, foul-ups still occur. "Every four months or whenever, people forget," Driscoll said. He estimated that one-third of his firm's network sales come from new customers whose nets have crashed catastrophically.

Some nets, such as Davong Systems, Inc.'s Multilink, sidestep the problem by automatically locking data at the volume level on the hard disk drive. This scheme "provides you with a lock, but doesn't provide you with a comfortable way to share data," Driscoll said. "We found it incredibly frustrating.

"You always should hold the application program responsible for the locks," he maintained. He agreed the Davong approach is helpful in the absence of multiuser applications, but he predicted that many such packages will become available by this fall.

Multiuser applications also offer different levels of locking and security, according to Software Connections, Inc.'s president, Buck Gee. "When we say multiuser, that goes along with defined users with defined capabilities in the data base," Gee said. "People tend to overlook this."

Unlike the multiuser Dbase II, the Software Connections product's security features include multiple levels of user access, he said. In addition, LAN:Datastore provides not only record locking and file locking, but also structure locking.

Packages should link to other multiuser programs as well, Gee said. Software Connections also offers electronic mail and time management packages.

IBM upgrades PCjr memory, keyboard

By Eric Bender
CW Staff

NEW YORK — IBM last week introduced memory expansion units and a typewriter-style keyboard for its PCjr, enhancements that address the low-end personal computer's two most criticized limitations.

The 128K-byte memory modules, priced at $325, can boost PCjr's random-access memory (RAM) incrementally to 512K bytes, the company said. The units reportedly include a program allowing the expanded memory to function as an "electronic diskette" or "RAM disk," permitting the system to run IBM Personal Computer software requiring dual disk drives.

The expanded PCjr "will be compatible with the vast majority" of IBM Personal Computer packages, said Philip Estridge, president of IBM's Entry Systems Division. "I'm sure you can find some that don't, but I suspect they will be rare."

IBM is offering the new 62-key keyboard as standard with all new PCjrs and is making it available free to current PCjr owners.

The keyboard is completely compatible with the previous PCjr keyboard and connects to the system via cord or infrared link, the manufacturer said.

The big league

IBM officials emphasized that the introductions bring the PCjr into Personal Computer territory. They pointed out that a 256K-byte single-disk-drive PCjr (without monitor) costs $1,324, while prices for a comparable Personal Computer begin at $1,995. Asked if the new PCjr will cannibalize Personal Computer sales, Estridge replied that "if that happens, it's OK with us."

This pricing scheme fueled speculation about a near-term unveiling of new higher end Personal Computer models. Industry observers also noted that an enhanced PCjr is an attractive candidate for use in local-area networks.

IBM also introduced a $300 speech synthesis attachment that reportedly contains 196 built-in words and records speech on diskette through microphone input. A new power expansion module (required to connect more than one memory, speech or printer attachment) costs $150.

All new hardware options are currently available, the company said. The base price for a 128K-byte PCjr (without the monitor) remains at $999.

In addition, the firm displayed new PCjr software packages, including IBM PCjr Colorpaint, a color drawing system employing a user-supplied mouse, which will be offered next month for $99.

Also last week, Lotus Development Corp. announced a read-only memory cartridge version of its 1-2-3 package, said to run on a PCjr with 128K bytes of RAM, which will be available in November for $495.

IBM Entry Systems Division can be reached through P.O. Box 1328, Boca Raton, Fla. 33432.

How Michael Krieger Made The Micro To Mainframe Connection

Michael Krieger is DP manager of *Augustus Fashions, Inc.*, a leading manufacturer of quality men's and women's clothing. His responsibilities include providing efficient communications between the firm's Manhattan factory and two showrooms, and its warehouses on Long Island and in New Jersey.

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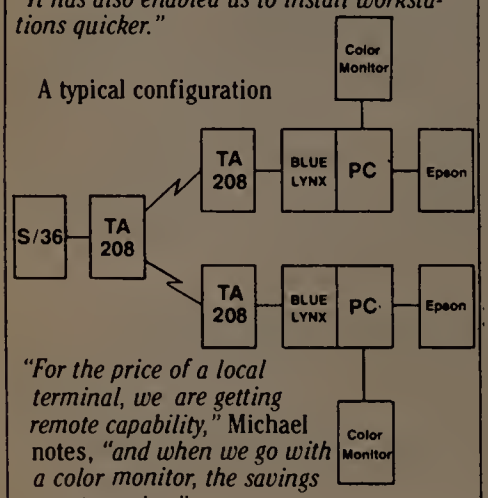

"For the price of a local terminal, we are getting remote capability," Michael notes, *"and when we go with a color monitor, the savings are staggering."*

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Boston	Sept. 25	New York City	Sept. 11
Charlotte	Oct. 31	Philadelphia	Oct. 18
Chicago	Oct. 9	Pittsburgh	Oct. 16
Cleveland	Sept. 6	Rochester	Nov. 1
Dallas	Oct. 17	San Antonio	Oct. 10
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Houston	Sept. 26	Washington, DC	Sept. 26

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NEWS

Insurer's network training program works from top down

By John Desmond
CW Staff

DURHAM, N.C. — James Hembree, branch manager of the Metropolitan Life Insurance Co. office here, had no experience whatsoever with computers when the company announced a training program on its Sales Office Network of Intelligent Computers (Sonic).

Before being named a branch manager two years ago, Hembree, 33, was experienced in sales and held a degree in accounting. Yet he was not intimidated when the network program was announced. The idea of being exposed to a new technology through a company training program appealed to him. He said he felt rather bombarded by the increasing use of computers in everyday life and had even considered buying a home computer to get on the bandwagon. Metropolitan, he said, was giving him a lift.

Metropolitan Life photo
Hembree

Hembree is one of 20,000 Metropolitan workers at 1,250 U.S. sites being trained on the company's recently acquired Honeywell, Inc. DPS 6/40 minicomputer-based network. An ambitious training program has been under way since last year, when the company installed systems in 123 offices. This year, the company plans to complete 1,100 installations, with the rest of the installations to be completed by next year. Lately, installations have been accelerated to the rate of 32 per week.

"We think we're going more rapidly than anyone has ever gone," said Richard Anderson, assistant vice-president of personal information systems. "We decided we would go as rapidly as humanly possible because technology was changing so rapidly. We decided to be extremely aggressive in installations," he said.

Metropolitan is spending over $30 million for the network hardware and approximately $3 million for the training program, Anderson said.

Sonic operates on an AT&T private-line network in which 50% of the system's uses are locally controlled. Each office is equipped with a DPS 6/40 with 1M byte of memory and 80M bytes of hard disk storage, two VDTs, one dot matrix printer rated at 450 char./sec and one letter-quality printer rated at 120 char./sec. Virtually every component of the system is a Honeywell product, save for Codex Corp. modems, Anderson said.

Applications of the Sonic system for Metropolitan include data entry and editing, a client data base specific to each sales office, word processing, electronic mail and policy and contract illustrations, Anderson said. Most Metropolitan workers will have a reason to use the system; nonusers will be a small minority.

The company learned two lessons from a pilot training program in Texas, Anderson said. First, it was difficult to conduct a training program at the user site, mainly because management was too caught up in day-to-day business. Secondly, "The program would only be as successful as we are successful in getting management to use it," Anderson said.

Metropolitan's plan for educating so many so fast was developed with the help of Resource Development Associates of Yonkers, N.Y. Called a top-down training program, it resembles an inverted pyramid in structure. Senior executives in the personal insurance field were trained first, senior sales staff were trained second and key people in eight regional head offices were trained next. Each regional office became home to a nucleus of six to eight trainers. "We had a training operation and we cloned it," Anderson said. "[Those trainers] are really the nucleus of our training program."

But they were only 2,000 of the 20,000 people the company sought to train. Next in line were the "critical users" — sales managers and office managers in 1,100 U.S. sales outlets. These users traveled to the company's eight regional head offices for training. And when the sales and office managers were trained, they became responsible for training sales office staff. The training emphasized hands-on experience, with 20% of the time spent in lectures and the rest of the time "actively using the system," Anderson said.

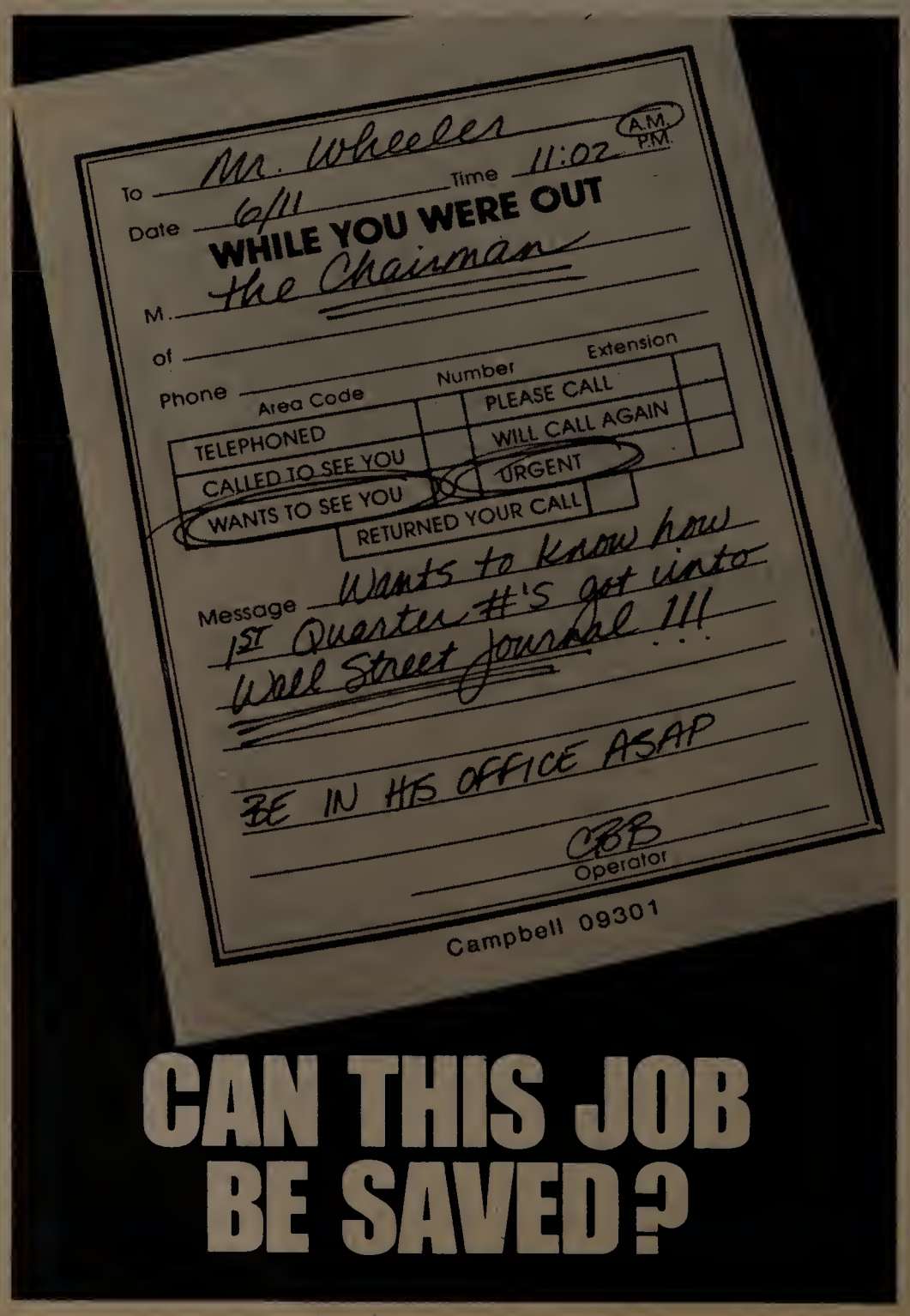
Network's most popular uses

The network's most popular uses so far have been illustrating policy values, showing policy status and electronic mail, he noted. Demand was so strong for word processing training that it was added to the training program, Anderson said. "We've had our pockets of resistance," he said of the training program's reception, "but by and large, the reaction has been more positive than we anticipated."

And what does Metropolitan hope to gain by installing its Honeywell network? Anderson said, "I think we have an advantage in that we have gone with a network instead of an independent system. We like to think we're at the front edge of the automated agency."

In Durham, Hembree is excited about the Sonic network's potential in a number of areas, including prospecting. Since industry figures show that age is a factor 70% of the time when insurance is purchased, he could keep a record of client birthdays, something that was impractically cumbersome in the past.

"To me, that's a fascinating thing," Hembree said. "You really have an opportunity to target certain policyholders."



UNIX from page 1

The IEEE is a logical group to back the effort because "IEEE spans the world and the disciplines," Isaak said. He added that he expected AT&T to join the committee's work. "The trick will be to pull together the right variety of people." He emphasized that the new IEEE committee wants a broad base of membership, which will not be restricted to IEEE members.

Isaak suggested that the IEEE group will be able to draw on the experience of /usr/group, an organization of Unix users that recently approved some Unix standards. IEEE can create "a broader backing for such standards than /usr/group can provide," he said.

Among the areas likely for the IEEE committee to address, Isaak said, are the application program interface to the operating system, file formats, object code integration and the operator-user interface.

In addition to simplifying hardware and software system design, establishing a broad-based, Unix-like standard would help to isolate vendors from shifts in AT&T policies, Isaak noted. Among current drawbacks for vendors, "every two years or so AT&T changes the licensing and pricing on everyone," Isaak said.

AT&T licenses on "a take-it-or-leave-it basis," said P. J. Plauger, president of Whitesmiths Ltd. in Concord, Mass., whose products include a Unix-compatible operating system. "They're ignoring previous practice on how software is licensed. Some people can't put up with that."

An IEEE-backed, Unix-like standard that does not conflict with other standards and is not tied to a single vendor would be wonderful for firms like Whitesmiths, Plauger maintained.

Although an IEEE effort may prove useful, "I have a hard time believing that they're going to get AT&T out of the driver's seat," commented Laura Stewart, an analyst with the Yankee Group in Boston.

David Fiedler, president of Infopro Systems, Inc. in Denville, N.J., added, "There's a lot of resentment when people get turned on to Unix and find out that it's not a standard." But he expressed doubts about the effectiveness of the IEEE effort, mentioning the IEEE's limited history in software standards and pointing to potential difficulties if the IEEE standards conflict with /usr/group standards.

Russell Gee, vice-president of Access Technology, Inc. in Natick, Mass., said, "Anybody who's doing anything to standardize the Unix world is guaranteed frustration, but somebody has to do it."

Meanwhile, some manufacturers of Unix-based systems took a wait-and-see attitude about the standardization effort. "It could mean a little to us, or it could mean a great deal," said one official at Fortune Systems Corp. in Redwood, Calif.

Isaak predicted a multiyear effort for the committee. Once the working group produces a document, that document must be approved by a balloting group and then taken to the IEEE Standards Board. If that board accepts the document, IEEE then passes the standard on to Ansi for a vote, he said.

The committee is scheduled to meet for the first time in Las Vegas Nov. 12-13. More information is available from Isaak at Charles River Data Systems, 983 Concord St., Framingham, Mass. 01701.

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NEWS

'Front-runner' OA system aids White House staff

By Mitch Betts
CW Washington Bureau

McLEAN, Va. — Office automation has come to the Executive Office of the President, enabling the White House staff to use computer workstations to schedule Cabinet meetings, analyze the federal budget and even place a digital version of President Reagan's signature on presidential correspondence.

Thomas K. Lewis Jr., director of the Automated Systems Division for the Executive Office of the President, last week described the office automation project — which was accomplished in less than two years — in a keynote speech to the Office Automation Society International Summer Workshop held here.

The project began with orders from Lewis' boss, John F. W. Rogers, assistant to the president for management and administration, and ended with what Lewis called "a model for office automation planning and a front-runner in the use of this technology within the federal government."

CW photo by M. Betts

Lewis

The project began in September 1982 with the installation of 177 IBM Displaywriters for the White House clerical staff, first used as stand-alone word processors and later enhanced to provide access to data bases, graphics and electronic mail, Lewis said.

In August 1983, Rogers asked Lewis to provide multifunction workstations for the upper echelon management as well and gave Lewis all of 60 days — with weekends off — to place a prototype on his desk. Rogers specified that the system should provide access to the personnel and financial data on the White House mainframe computers for spreadsheet analysis, electronic mail for executives in the west wing of the White House and Cabinet departments and access to news wire services.

In addition, Lewis said it was clear that senior staffers would require a very user-friendly system, replete with menus and function keys that would mask the commands of canned programs, so that user training would take no more than 20 to 30 minutes.

For the workstations, Lewis chose the IBM Personal Computer for professional staffers, such as budget analysts, and the IBM Personal Computer XT for top-level presidential aides, using the XT's greater power to make the system easier to use.

After developing the user-friendly software, including communications software that automatically dials the telephone number and turns on the modem, Lewis delivered a prototype IBM Personal Computer XT to Rogers in late October, in exactly 60 days. He called it the Executive Office of the President Network (EOPNET).

Subsequent enhancements to EOPNET, he said, permitted the White House staff to access outside data bases of economic statistics, search through presidential public documents, create a telephone directory, track staff assignments and keep track of official White House positions on political issues.

The project ended as 'a model for office automation planning and a front-runner in the use of this technology within the federal government.'
— Thomas K. Lewis Jr., Automated Systems Division director.

There are now 10 senior presidential aides — including Craig Fuller, special assistant for Cabinet affairs, and Richard Darman, deputy chief of staff — using EOPNET workstations, and another 10 to 15 will be added by Oct. 1, Lewis said.

"The implementation of all of the [workstations], the development of EOPNET and training of over 300 staff members, has occurred in under 18 months under the direction of Patrick Shannon, who serves as manager of information systems for the White House," Lewis said. "In fact, EOPNET has evolved to its current state since August 1983 with just four staff members, only two of whom are experienced programmers."

For the future, Lewis said he hopes to enhance EOPNET with facsimile distribution, windowing features and, ultimately, the installation of a local-area network.

Beyond the many unanswered technical questions about local-area networks, Lewis said, "we face several security and architectural problems when deciding to run cables through the west wing of the White House."

In addition, he said, the old Executive Office building, built in 1888 before the widespread use of electricity, has another set of problems: It has 18-in. interior granite walls and no existing internal conduit for running cables.

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NEWS

Beta test site gives Peachtree package mixed reviews

Data base, graphics tools impress users; word processing, spreadsheet seen as average

FIRST USER

By Edward Warner
CW Staff

ATLANTA — The beta test version of Peachtree Software, Inc.'s new Decision Manager integrated package had excellent graphics and data base capabilities, but its word processing and spreadsheet were no better than average.

So said microcomputer analyst Gerald Brouillette of the Coca-Cola Co.'s U.S. headquarters here, which beta tested the software.

In all, Coke tested five versions of Decision Manager as the software was fine-tuned prior to release, and, Brouillette said, Coke is likely to add the Decision Manager to its list of software. Coke's placement of Decision Manager on its approved software list will make Decision Manager a buying target for the hundreds of microcomputer users within the soft drink company, he said.

Decision Manager was shipped commercially June 15 to do battle with Ashton-Tate's Framework and Lotus Development Corp.'s Symphony, integrated packages on the open market. The software includes a word processor, spreadsheet, graphics and data base functions and can communicate with microcomputers and mainframes. It can also reportedly window 10 active files at one time.

'Coke's placement of Decision Manager on its software list will make it a buying target.'
—Brouillette, microcomputer analyst for the Coca-Cola Co.

Decision Manager runs on the IBM Personal Computer and Personal Computer XT with at least 256K bytes of memory and PC-DOS 2.0 or later or, in the case of a system using a Corvus Systems, Inc. hard disk storage unit, with PC-DOS 1.1.

It was Decision Manager's graphics and data base that convinced Brouillette of the product's merit, he said. The printout quality of the graphics function was superior to that of comparable products, according to Brouillette.

The graphics function also allowed charts and graphs to be viewed in all eight colors of the IBM Personal Computer's color spectrum, "while on [1-2-3], the only time you can view the graph is within the spreadsheet, and all you've got are three colors: magenta, cyan and white."

Decision Manager's data base, Brouillette continued, had strong internal file maintenance features — users could erase, close and open files without going into the operating system — and was also the "first data base that I've seen that actually gave password protection" to files.

In addition, he said, the data base function lets users "create the input screen the way you like to input data. . . . This way, you're allowed to make the format anywhere over the screen." That feature was a big plus for Coca-Cola, where many data-key operators are used to working with one kind of form.

Ironically, it was with the data base that Brouillette also found what he called Decision Manager's biggest problem: A file would be reloaded each time he wanted to create a different application, causing a 20-sec delay. "That's the one fault with the whole package that I [found]."

A Peachtree spokeswoman, meanwhile, admitted the delay exists, but said it was more like 15 seconds.

Decision Manager, Brouillette said, will likely be used most at Coke by the "guys that would sit against their [Personal Computer] screen all day." But, he added, the software's menu-driven functions and a mouse for cursor control make it attractive to novice users. "New users adapt to a mouse very easily," he said, "which made [Decision Manager] a very slick product to them."

While no on-line tutorial was provided for Decision Manager, Brouillette noted that each of its functions included its own tutorial file. Decision Manager's manual was clearly written, he said, but "here at Coke, we place a lot of emphasis on being able to do things without the manual."

Instead, the analyst said, he would have preferred to see a reference card included with the manual so that casual users could determine commands at a glance.

Peachtree's support, he said, was "super," and problems were usually solved quickly. "Almost every time I called [the company], they knew the problem, [and] they knew the answer to it," he said. "They really cared about the input we gave them."

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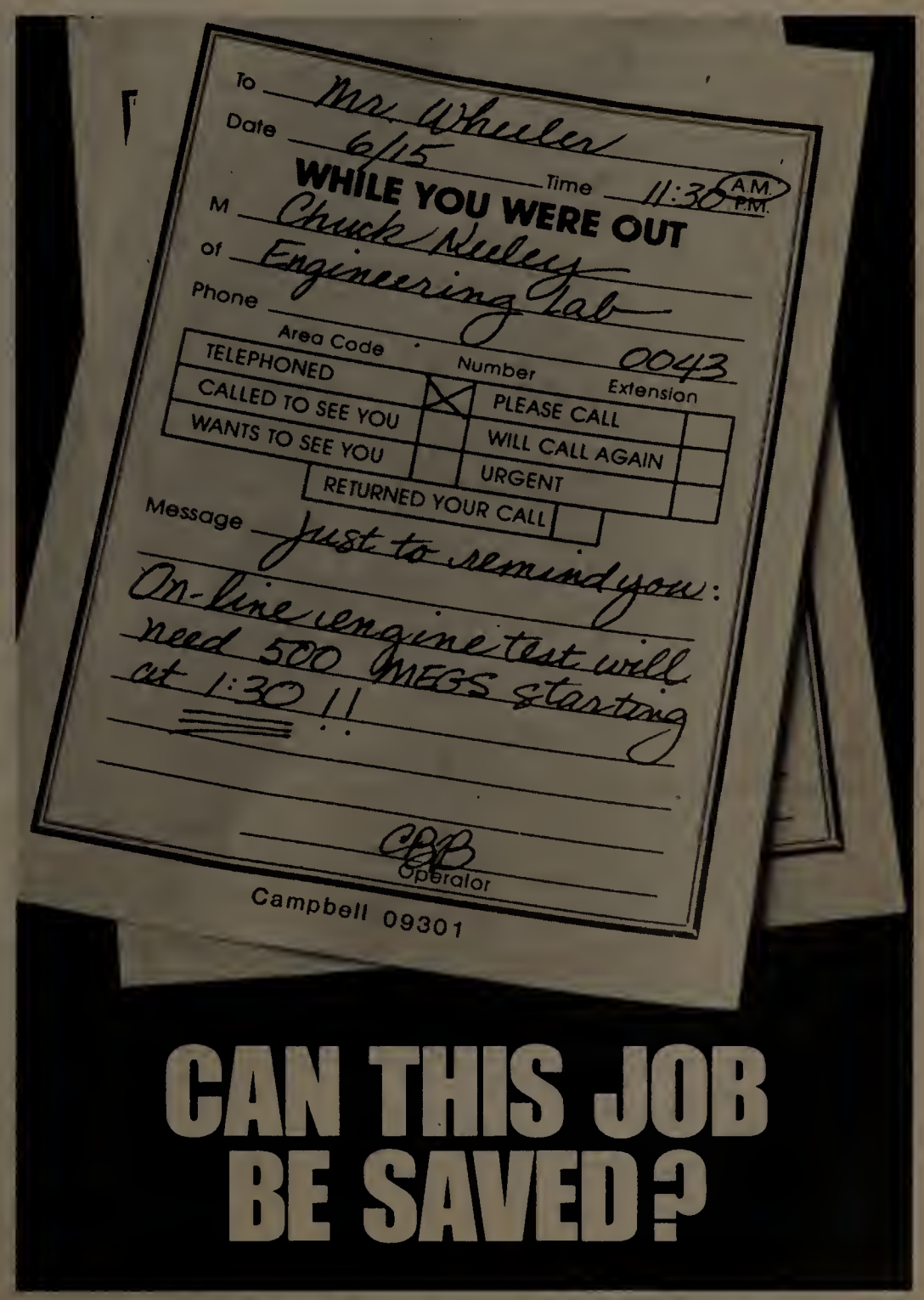

CAN THIS JOB BE SAVED?

NEWS

Judge limits phone companies' unregulated offerings

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Efforts by the divested Bell operating companies to offer certain competitive services and to enter other new businesses were sharply rebuffed late last month by a U.S. District Court judge.

Judge Harold Greene barred the companies, under any circumstances, from manufacturing equipment or providing interexchange services or information services and said, in effect, that other business activities would have to meet specific conditions before they could be approved.

Greene's ruling was issued after the seven regional holding companies, which own the former Bell operating companies, proposed combining allowed and prohibited services into packages that would be designed to lower communications costs for tenants of office buildings and industrial parks.

Data processing, least-cost routing, facilities management and communications consulting and engineering were some of the other service components the telephone companies would package.

Because AT&T is already authorized to offer such services, it poses a serious threat to the divested operating companies, the regional holding companies said.

Their key point was that multitenant services would cause traffic now transported through local exchange networks on dial-up circuits to be diverted to bypass facilities, thus reducing the operating companies' revenues. The holding companies also contended that business customers' preference for a single vendor would give AT&T a competitive advantage in marketing terminal equipment.

Retain monopoly

Greene, however, pointed out that unlike AT&T, the operating companies "retain what is in law and reality a monopoly over a critical aspect of the nation's telephone service." While AT&T's customers can go elsewhere if the company "squanders its resources on unprofitable nontelecommunications ventures . . . or fails to render quality service . . . that is not so with respect to customers of the [local] operating companies," he said.

The judge insisted that allowing the regional holding companies to enter new businesses would divert resources, both human and financial, from their primary responsibility — which is to provide local exchange service.

Under the 1982 consent decree, the regional holding companies can enter new markets by showing that local exchange service will not suffer and competition will not be adversely affected.

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OLYMPIC from page 1

Soon, he and his family are speeding their way toward Venice (Calif.) to luxuriate in the gustatory delights of chianti, cappuccino and cannoli.

Since July 1, the preceding vignette or variations thereof have been duplicated some 20,000 times per week at the 15 automated Olympic Information Centers that dot this Southern California megalopolis.

Housed in local Robinson's department stores and installed specially for the purpose of the 23rd Olympiad, the centers are expected to log as many as 200,000 user transactions before being dismantled at the Games' end.

In essence, the centers serve as microcomputer-based videotex systems that reportedly provide nearly instantaneous access to information about 400 to 500 local restaurants. But eating establishments are only the beginning. Also contained in each system's electronic data base is detailed information about area theaters, shops, public transportation and a plethora of Olympic-related topics, including events schedules, medal standings and competitive results, a Robinson's source said.

Each Information Center consists of a 64-sq ft kiosk housing, among other things, a PC 8800 microcomputer from NEC Information Systems, Inc.'s Home Electronics Division. In addition to the processor itself, each system incorporates an 80-col., 24-line NEC monitor, an SCI Systems, Inc. electrostatic printer and dual 320K-byte floppy disk units, which hold 700 to 1,000 screens of information.

To the NEC and SCI hardware, Providence, R.I.-based PL Systems, Inc. has added its own software and Interaction Systems, Inc.'s touchscreen technology. The result is a public access information service known as Data Touch.

Operated by American Express Co., the centers use only three main screen formats, according to PL Systems President Peter Lipman.

Unlike most other videotex systems, which store their information in the form of screens, Data Touch is built around "one huge text file," Lipman said. "This text orientation allows us to store data much more compactly on our floppy disks than would otherwise be possible. To create a screen, the system simply goes to its text file, pulls out the necessary information and assembles it into the right format."

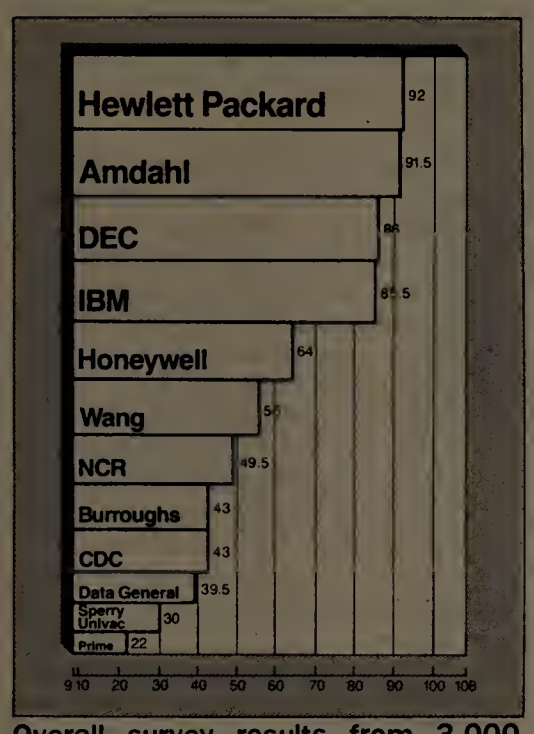
HP, Amdahl top list in survey of mini, mainframe users

BELLEVUE, Wash. — Respondents in a recent survey of satisfaction levels of mainframe and minicomputer users ranked Hewlett-Packard Co. and Amdahl Corp., in that order, tops among 11 computer manufacturers. They also gave the survey's cellar spot to Prime Computer, Inc., primarily because of what they said were the agedness of its hardware and problems with service.

The survey's 3,000 respondents, drawn from data processing departments nationwide, also scored service of both hardware and software as the industry's biggest problem. Exactly 33% of the respondents singled out service from a list of 14 qualities as the biggest headache with their systems. On the positive side of that list, 59% of those polled said their equipment's reliability was its strongest feature.

The survey, titled "Computer Users, An Opinion Survey," was done by telephone by Stuart Kirkland, an opinion research firm located here. Respondents' firms spanned the gamut from aerospace to the transportation industry, with the greatest number of them in manufacturing and education.

Amdahl and HP were joined at the top of the overall satisfaction ranking by Digital Equipment Corp. and IBM, in that order. A spread of 21.5 points separated the four from the next in line, Honeywell, Inc.



Overall survey results from 3,000 data processing shops.

The man who headed the survey effort, Bill Stites, explained IBM's fourth-place ranking by noting that the industry giant placed fifth in hardware, second in service and third in software, the three main satisfaction categories.

Amdahl, by contrast, placed first in hardware, third in service and first in the survey's fourth main category, "the manufacturer as a company to do business with," where IBM placed second.

In the survey's software satisfaction category, DEC was the big winner, leading the composite ranking by 13.5 percentage points over second-place HP. DEC software users said they liked the documentation, ease of use, application programs and the system software, including its operating system. At the bottom of the software category's composite ranking was Sperry Corp. Sperry software users gave a special thumbs-down to its application programs and support.

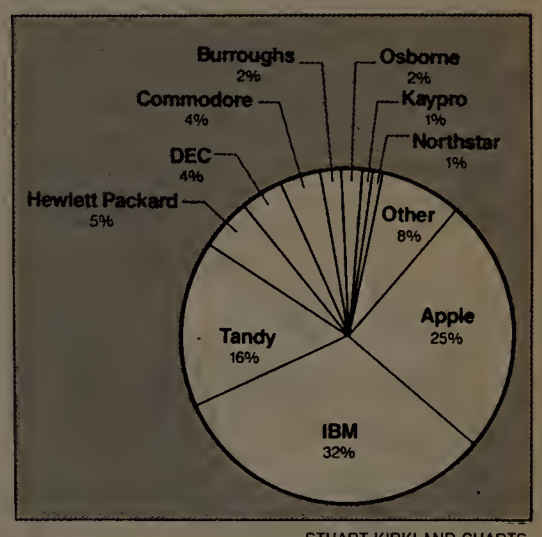
In its ranking of computer hardware, Amdahl edged out HP by a percentage point for the top rating. The hardware of both firms was lauded for its ease of use and reliability. In the cellar again was Sperry, roughly tied with Control Data Corp. and Prime for the title of least liked.

In a sidelight, the survey also quizzed respondents about their satisfaction levels for the microcomputers in use in their shops and turned up a few surprises. Asked to name the brand of the micro most used in their firm, only 32% said IBM, while 16% cited Tandy Corp. and 25% cited Apple Computer, Inc.

When asked how satisfied they were, however, users sent Tandy and Apple to the rear. Of the three brands most in use, only IBM was near the front in satisfaction, and in fourth place at that.

Another surprise finding was the top-ranked micro in the user satisfaction ratings — Kaypro Corp., which was used by only 1% of the respondents.

"Computer Users, An Opinion Survey," is available for $125 from Stuart Kirkland, which can be reached at No. 17, 10636 Main St., Bellevue, Wash. 98004.



STUART KIRKLAND CHARTS

In its spotlight on microcomputer use, the survey found that diversity reigns. Ten manufacturers' micros were named by respondents as being in use; seven vendors had a total installed base of 19%, but none of those had a share of that base greater than 5%.

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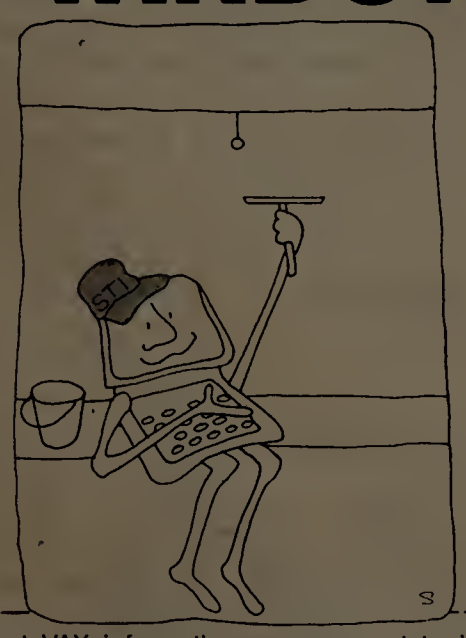

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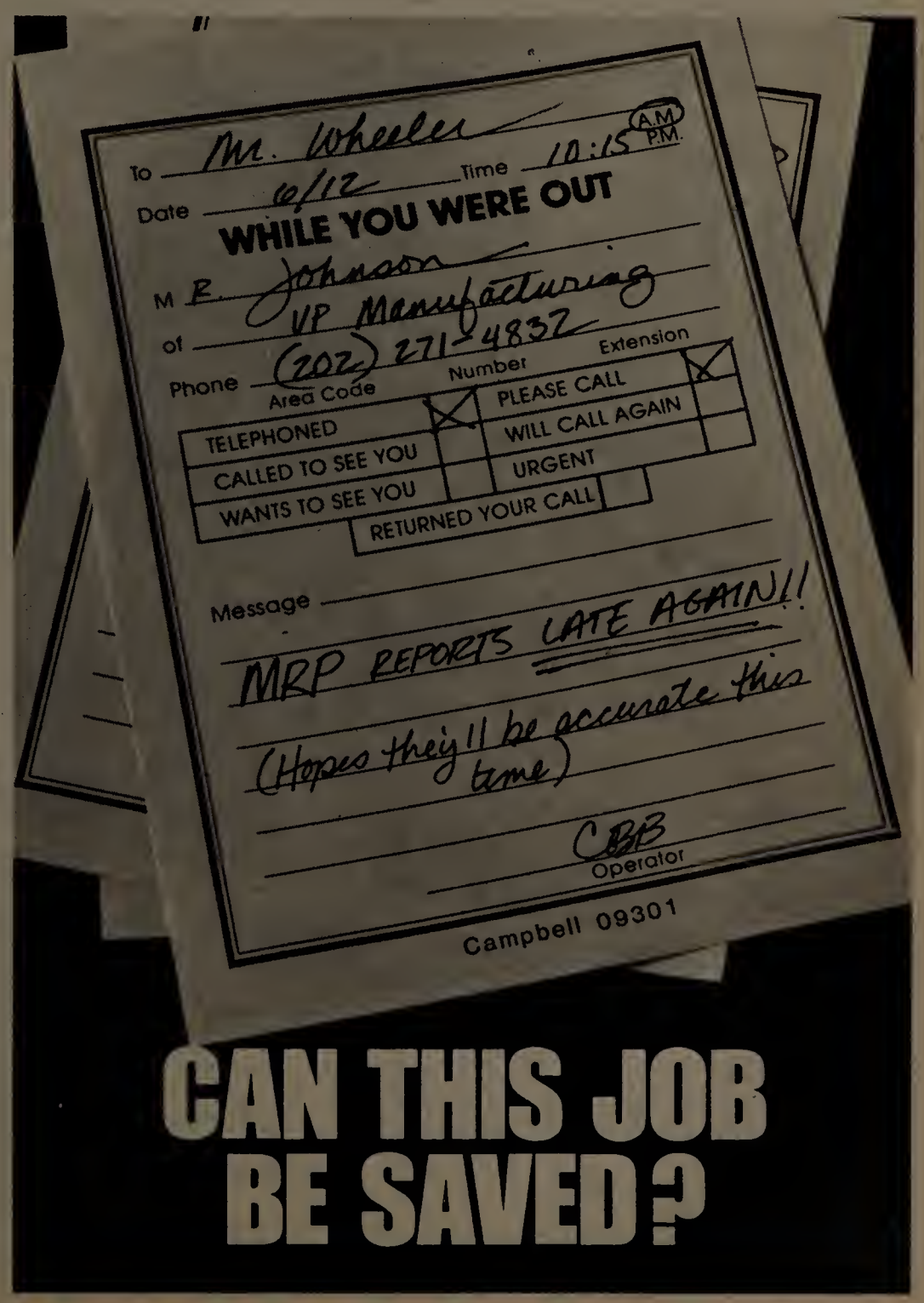

CAN THIS JOB BE SAVED?

NEWS

Japanese industry seen turning to CIM

CW AT SIGGRAPH '84

By David Olmos
CW Staff

MINNEAPOLIS — From the automated production of ships' hulls to the computer-aided design of rice cookers, Japanese industry is increasing its use of computer-integrated manufacturing, several representatives from Japan said at a recent conference here.

Addressing the 11th Annual Conference on Computer Graphics and Interactive Techniques, Siggraph '84, at a session titled "Computer-Integrated Manufacturing in Japan," Tosiyasu L. Kunii, professor in the Department of Information Science at the University of Tokyo, said that although Japanese industry is becoming increasingly robotized, "this cannot solve all the problems in computer-integrated manufacturing."

CW photo by D. Olmos
Kunii

Computer-integrated manufacturing (CIM) in Japan includes the integration of computer graphics, data base management systems, local-area networks, software engineering and robotics. Kunii described one technique under development at the University of Tokyo that is intended to reduce the design and control problems that occur in automated manufacturing. The technique is called systematic decomposition of manufacturing (Sydem) and is a method to allow as perfect a design of automated factories as is possible, Kunii said.

Based on top-down design, Sydem employs computer graphics techniques to design product modules for machining, assembling and storage by computer-controlled machines like robots. "Sydem is instrumental in realizing true CIM," he said.

Hajime Inaba of the GM-Fanuc Robotics Co., Ltd. plant in Japan, a joint research effort of General Motors Corp. and Fanuc, described that company's engine assembly factory.

In a video presentation, Inaba showed a sterile-looking plant in which human employees were virtually nowhere to be seen. The plant, which employs about 60 people and 100 robots, operates around the clock; at night, it operates completely unmanned. Inaba said that since the plant became even more highly robotized, with fewer human workers now employed, productivity has increased about six times.

The Japanese plant, which employs about 60 people and 100 robots, operates around the clock; at night, it operates completely unmanned.

Kazuo Nakagawa, manager of Mitsui Engineering and Shipbuilding Ltd., discussed how his company uses computers to aid in the labor-intensive shipbuilding industry.

At the Mitsui-Chubi Works plant, Nakagawa said, computers are used extensively in the design of ships, such as in creating models of the conditions at sea. Cutting, welding and monitoring of the production work is computer-controlled. The use of computers has benefited the factory's workers, Nakagawa said, by improving working conditions and job safety.

Naomasa Nakajima, a professor at the University of Tokyo, is using computer graphics to devise a method of predicting design faults not noticed by the human designer. The purpose is to minimize design flaws and the need for product testing, he said.

Nakajima said his approach differs from other kinds of evaluation methods for product design. Instead of concentrating on things like computer simulation of physical phenomena, the technique concentrates on "depicting and simulating the thought processes of the human designer," he said.

The University of Tokyo's Kunii said an important feature of CIM in Japan is that Japanese manufacturers always make extensive internal use of their products before sending them out to market.

This is done, he explained, because companies are afraid their reputations will be damaged if they put out a flawed or inferior product.

Lotus files infringement suit

CAMBRIDGE, Mass. — Lotus Development Corp. last week said it has filed a $1 million lawsuit against a Tennessee company for alleged copyright infringement of Lotus' 1-2-3 software program.

The suit charges Health Group, Inc., a health care management company in Nashville, with making several unauthorized copies of the 1-2-3 program and distributing them to hospitals and nursing homes. The suit seeks statutory damages of $50,000 for each alleged copyright infringement and estimates total damages at not less than $1 million.

In a response to the suit filed in the U.S. District Court for the Middle District of Tennessee in Nashville, Health Group acknowledges that some "low-level" employees in its MIS department did engage in some "partial copying" of the 1-2-3 program last January and February. The copies were used for "analysis and demonstrations within the company to study the feasibility of 1-2-3 for their applications," a spokesman for Health Group said.

The Health Group spokesman said that no officers of the company knew of the possible copyright infringement until late April or early May, at which time they ordered the copies destroyed. The company then purchased 15 copies of 1-2-3 at a retail store, according to the Health Group spokesman.

"We feel we have meritorious defenses to this lawsuit, and we will prevail," the spokesman said.

According to Lotus, 1-2-3 customers are bound by a license agreement that says purchasers "may not . . . make copies of the user's manual or the 1-2-3 system disks."

In a statement, Mitchell D. Kapor, Lotus president, said that "as long as the illegal copying and dissemination of software continues to be a serious problem, we will vigorously and diligently pursue all offenders."

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How does your organization use business graphics?

A man-on-the-street interview at Siggraph '84 by CW staff writer David Olmos

***Arvid Lee*, manager, information center, Republic Airlines, Minneapolis:**
"What we need and what we have started working on is a way of providing a graphics image of our key daily operations. The graphics could be made available for operational meetings and on a demand basis. The biggest logistical problem we have to overcome is the tremendous volume of data reduction."

***Claude Roleff*, manager of photography/audiovisual reprographics, FMC Corp., Minneapolis:**
"We're expanding one of our major departments, and we're using computer-generated 35mm slides for employee recruitment. We're also using our computers to do illustrations of products, putting them into a simple image."

***Ronald A. Roth*, supervisor, graphic arts department, Sperry Corp., Minneapolis:**
"We generate slides for presentation for management and for customer and marketing services. We've been using a [Dicomed Corp.] computer for the last few months; we couldn't be without [it] now. The artists are excited about it."

***Michael Floerchinger*, communications support, Norwest Information Services, Inc., Minneapolis:**
"We're working on creating a schematic of our data communications network from some type of descriptive data base. This would be so our network operations people could see what the network looks like. We don't have a complete diagram of our network now."

***George Chrisman*, manager, processing systems services and support, Geophysical Service, Inc., Dallas:**
"We're using a Lotus Development Corp. 1-2-3 package and a Hewlett-Packard Co. plotter to generate a variety of systems availability and systems performance graphs, financial data and flow rate charts. There is no way we could go back to doing these by hand."

CW photos by D. Olmos

***Kapila Bobra*, systems analyst, Metropolitan Council, state of Minnesota, Minneapolis:**
"We use a lot of business graphics to analyze census data by population figures, income levels, employment, ethnic groups, education level and so on. I used graphics to design an end-user income tax audit for the state's Department of Revenue.

"The presentations by picture are a lot better; it's like the difference between watching a movie [and] reading a book."

***Robert New*, manager of strategic marketing, Northern Telecom, Inc., Southlake, Texas:**
"We're working on some ways of integrating trends [of the past with] forecasts of the future, along with taking adaptive feedback mechanisms to alter our future events operations."

Meet to focus on audit techniques

CHICAGO — The Fourth Annual Conference on Control, Audit & Security of IBM Systems will be held Oct. 1-4 at the Drake Hotel here.

Sponsored by the MIS Training Institute, Inc., the conference will present security, control and audit techniques that can best be applied to maintain a climate of integrity within computer systems, while also maintaining productivity and growth within the organization, conference organizers said.

Five full-day tutorials will cover critical security and audit issues of MVS, CICS, IMS, Systems Network Architecture and VM. During these sessions, sample JCL, utilities and actual audit programs will be distributed.

The remainder of the conference will be devoted to concurrent workshops in which technical audit concerns are discussed. Keynote speakers include Frank Dodge of McCormack & Dodge Corp. and Bill Murray of IBM's Information Systems & Communications Group.

Additional information is available from the MIS Training Institute, 4 Brewster Road, Framingham, Mass. 01701.

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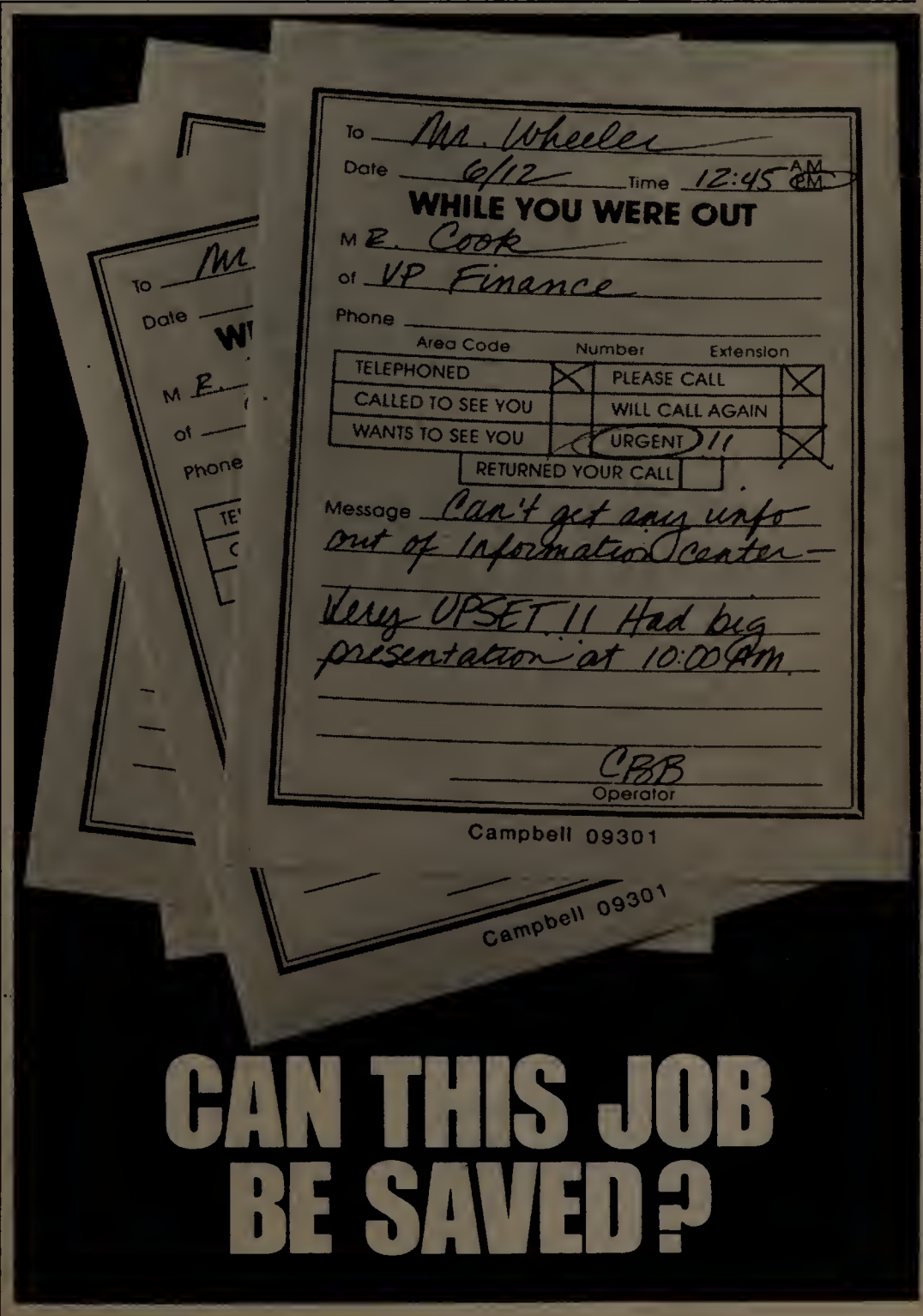

Panel examines history, future of computer graphics

CW AT SIGGRAPH '84

By David Olmos
CW Staff

MINNEAPOLIS — Computer graphics is "the shaping of the invisible so that it might be seen."

With that definition, Alan Kay, formerly of Atari Corp. and now with Apple Computer, Inc., led off a retrospective discussion of computer graphics here recently at Siggraph '84, the 11th Annual Conference on Computer Graphics and Interactive Techniques.

In a session titled "A Retrospective: Six Perennial Issues in Computer Graphics," Kay and other speakers traced the history of computer graphics and the role it has played in computing and information processing.

'Not much has happened [in computer displays] in 25 years, but the good news is the displays now work.'
— Carl Machover, Machover Associates Corp.

When graphics began

While it was generally agreed that computer graphics as an industry began more than 15 years ago, some of the speakers traced its origins back almost 30 years to the beginnings of the first computers themselves. And others traced its origins still further — to primitive cave drawings.

Kay said the computer graphics industry has matured and is now receiving an influx of venture capital, as is artificial intelligence. The field has arrived at a crossroad, he said.

Kay said the next challenge for the field of computer graphics will be to move from the concrete to the abstract.

That will involve getting people involved with more interactive systems, in which the user will be encouraged to think and learn in more abstract ways.

DP 'designer jeans'

"Artificial intelligence and expert systems, the way they are now presented, are the designer jeans of computer science," Kay said, receiving laughter and applause from the audience.

Karl Machover, of Machover Associates Corp., traced the development of display technology and its use in graphics systems.

Since they originated, Machover said, displays have not changed much in size or in the amount of data that can be displayed.

"Not much has happened in 25 years," he said, "but the good news is that the displays now work."

Important development

One of the most important developments in display technology occurred in the late 1960s, with the advent of the storage tube, which, although difficult to see and use because of its small size, was far less expensive than anything previously designed, according to Machover.

"It is impossible to overestimate the importance of the storage tube to the growth of the graphics industry," he told his audience.

Flat panel displays are the wave of the future, Machover said.

Futuristic displays

He showed the audience slides of futuristic-looking flat panel displays that were desk- or wall-size.

James Foley of George Washington University in Washington, D.C., discussed the progress being made in interactive devices such as light pens, mouses and windows.

Foley listed several challenges for computer graphics, including designing systems that are easier for first-time users to operate, developing better software tools and integrating expensive systems technology.

Learn about people

In addition, he said, computer technicians will also have to learn more about people.

The session also included a short audiovisual presentation created by Dr. Steve Levin of Electronic Graphics Associates and David Wilson of Technical Marketing Ltd.

That presentation has been made available to the Computer Museum in Boston.

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Study: Bypass won't hurt local carriers

PARAMUS, N.J. — Although bypass will increase markedly by 1990, local telephone companies will not lose much business or revenue as a result, according to a recent 359-page study published here by Perspective Telecommunications Group, a communications consulting firm.

The study estimated that about 600,000 bypass circuits are in use today. By 1987, the number will be 1.5 million, and by 1990, it will be 3.5 million, the study said.

In 1990, the study added, use of intracity bypass circuits will generate about $1 billion in revenue, or 3.6% of the estimated $27.9 billion that nonresidential users will pay for local circuits that year.

The Perspective Group contended that local telephone companies are busily building new local distribution facilities to fend off competitors.

This construction, together with sympathetic state regulatory agencies, will help the carriers retain virtually all of their present market share, according to Perspective.

According to the study, "Major telecommunications users are still reeling from the impacts of divestiture. They are finding it so difficult to maintain their current systems . . . [that] additional demands for implementation of bypass alternatives are almost out of the question."

Rates announced for NYC Teleport

NEW YORK — Initial rates for New York's new Teleport were announced late last month. Customers who sign up before Sept. 30 will be protected against rate increases for at least three years, a spokesman said. He added that service is scheduled to begin during the first quarter of 1985.

The Teleport's communications facilities will include satellite earth stations, located on Staten Island, N.Y., together with a connecting fiber-optic network that extends into New York and northern New Jersey.

Fiber-optic T-1 circuits within Manhattan will be priced at $650/mo to $800/mo, depending on the quantity ordered, while similar connections between Manhattan and Staten Island will cost $1,000/mo.

T-3 circuits, operating at 45M bit/sec, will cost $10,000/mo, the spokesman said.

A full-duplex video channel between Manhattan and the Teleport will cost $13,000/mo, while the channel plus a two-way satellite connection will cost $18,000/mo.

A private earth station site can be leased for between $10,000/mo and $15,000/mo.

AT&T APS offering deferred yet again

WASHINGTON, D.C. — AT&T's proposed Accunet Packet Service (APS), which offers rates far below those now charged by commercial packet network operators, was deferred again last week, this time to Aug. 13. The previous date was Aug. 3, but it was preceded by three others.

APS combines AT&T's Basic packet-switched service with Dataphone Digital Service transmission channels. IBM objects to the bundling of these functions, while GTE Telenet Communications Corp. says AT&T's proposed rates will not recover the costs of providing the new service.

A commission spokesman said last week that the latest deferral is needed to assess these objections in light of AT&T's recent agreement to raise APS rates 12%.

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30 Medicine/Law/Education
40 Wholesale/Retail Trade
50 Business Service (except DP)
60 Government—State/Federal/Local
65 Public Utility/Communication Systems/ Transportation
70 Mining/Construction/Petroleum/Refining
75 Other User _____
Vendors
80 Manufacturer of Computers, Computer-related Systems or Peripherals
85 Computer Service Bureau/Software/Planning/ Consulting
90 Computer/Peripheral Dealer/Distributor/Retailer
95 Other Vendor _____

2. OCCUPATION/FUNCTION (Circle One)
11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Financial Officer
21 Director/Manager/Supervisor DP/MIS Services
22 Director/Manager of Operations/Planning/ Administrative Services
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
35 OA/WP Director/Manager/Supervisor
38 Data Comm Network/Systems Mgmt
41 Engr/Scientific/R&D/Tech Mgmt
51 Mfg Sales Reps/Sales/Marketing Mgmt
60 Consulting Mgmt
70 Medical/Legal/Accounting Mgmt
80 Educator/Journalist/Librarian/Student
90 Other _____

3. COMPUTER INVOLVEMENT (Circle all that apply)
Types of equipment with which you are personally involved either as user, vendor or consultant
A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems

CW-139

NEWS

Combat obsolescence with continuing education, experts agree

By Edward Warner
CW Staff

WESTON, Mass. — A software engineer or technical support person may be obsolescent in two or three years if he fails to take continuing education classes regularly, according to Edward J. Somol, corporate vice-president of Cullinet Software, Inc.

Somol, who made his comments at a panel discussion hosted here recently by Boston's Northeastern University on the problem of high-tech employee obsolescence, said he based his estimation on the fast rate of innovation that characterizes the computer industry. Another panelist, Joseph Smyjunas, a senior communications network consultant with Wang Laboratories, Inc., said change was happening so fast that an engineer must spend 20% of his time keeping up to avoid being outdated.

To combat obsolescence at Cullinet Software, Somol said, the firm presents in-house courses led by Cullinet employees and contract speakers on management and technical topics. Cullinet, he said, sees employee obsolescence as a "competitive issue," in terms of keeping pace with competitors and in terms of creating the proper environment to attract employees. Between 500 and 600 of Cullinet's 1,000 employees took an average of seven courses from among those offered by the company last year, he noted.

Lotus Development Corp. also offers in-house instruction to all its employees, including courses on how to use its software and how to get things done within the company, according to panelist Chris Morgan, Lotus' vice-president for communications. Lotus, which doubled its staff to 300 this year, calls its course on how to get things done within the company "The Influence Game."

The discussion also elicited some knocks against higher education and particularly the way in which it trains engineers. John Jordan, a Northeastern University dean on the panel, said the tenure system often kept obsolescent faculty on college staffs, and Morgan got guffaws when he told the group of reporters and educators who attended the conference that, in college, he and fellow engineering students were treated by most instructors "as nerds who had reached the age of reason."

Colleges must train the whole person and not just provide specialized technical education, Morgan said. Few are doing that right now, he said, adding that the problem is reflected most obviously in poorly written documentation. Morgan lauded those firms that provide reimbursement for employees who further their education, and he suggested that all employee education need not go on in a classroom.

Asked what he would do to further the education of an obsolescent electrical engineer, he answered, "Give him a microcomputer." A micro, he said, would give access to data bases of engineering information and would also let the employee know of changes in electronics of the last decade.

Morgan also had advice on how to ensure that a company-sponsored education program will succeed. "Go right to the top," he said, and have the highest levels of management take classes.

Chicago to host DP security meet

CHICAGO — The Computer Society Institute's 11th annual Computer Security Conference and Exhibition will be held here Nov. 12-14 at the Hyatt Regency O'Hare.

The program will include nine general sessions, 60 workshops and seven optional one-day seminars.

Federal Bureau of Investigation Director Judge William H. Webster is among the guest speakers for the program.

Registration costs $625 per person. Team rates are $595 for the second person and $580 for each additional attendee.

For more information, the Computer Security Institute is located at 43 Boston Post Road, Northboro, Mass. 01532.

China Comm '84 set for Nov. 5

WASHINGTON, D.C. — The People's Republic of China will host "China Comm '84," an international telecommunications, computer and electronics exhibition scheduled for Nov. 5-13 at the Beijing Exhibition Center. About 140 companies from 12 countries have agreed to sponsor exhibits at the conference.

The Chinese Ministry of Posts and Telecommunications and the Ministry of Electronics Industry have designed the show as a "major procurement event." Both ministries have set aside foreign exchange for off-the-floor purchases at the exhibition.

More information is available from Clapp & Poliak International, which is producing the show, at P.O. Box 70007, Washington, D.C. 20088.

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NEWS

INTERNATIONAL REPORT
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AUSTRALIA

CANBERRA — The federal government here has penned a $5 million research and development contract with Wormald Ltd. The contract calls for Wormald to design and develop fiber-optic sensors and sensor systems commercially.

CHINA

BEIJING — The First International Conference on Computers and Their Applications, sponsored by the U.S. Institute of Electrical and Electronics Engineers Computer Society and China's Computer Society, was held here recently. Some 250 representatives from 18 countries attended the event, where 132 technical papers were presented.

■

BEIJING — A joint venture between the China Electronics Import and Export Corp. and Japan's K.C. Ltd., called International Computer Software Corp., has opened for business in Kobe, Japan. The software house's objective is to create Chinese character processing software and application software for various minicomputer and microcomputer vendors. The firm also has plans to develop business, office automation, educational and other software for end users.

JAPAN

TOKYO — Intel Corp. President Andrew Grove announced that his company's goal is to reach $1 billion in sales here by the early 1990s. Grove did not provide current sales figures, but did reveal that Intel's annual sales have more than doubled since 1979. Intel's strategy to further its market penetration here includes increasing its product availability and strengthening working relationships with the Japanese, according to Grove.

■

TOKYO — Toshiba Corp. has introduced a 32-bit system called the Tosbac UX-700, which is said to add high-level Japanese word processing capabilities to the firm's Unix-like operating system. This system also reportedly features networking, graphics tools, compatibility with the vendor's high-end UX machines and on-line configuration with Toshiba superminicomputers. A basic UX-700 system costs $45,000 and has 1M byte of main memory, a 1M-byte floppy disk drive, a graphics display device and a serial printer, the vendor said. The system is available this month.

■

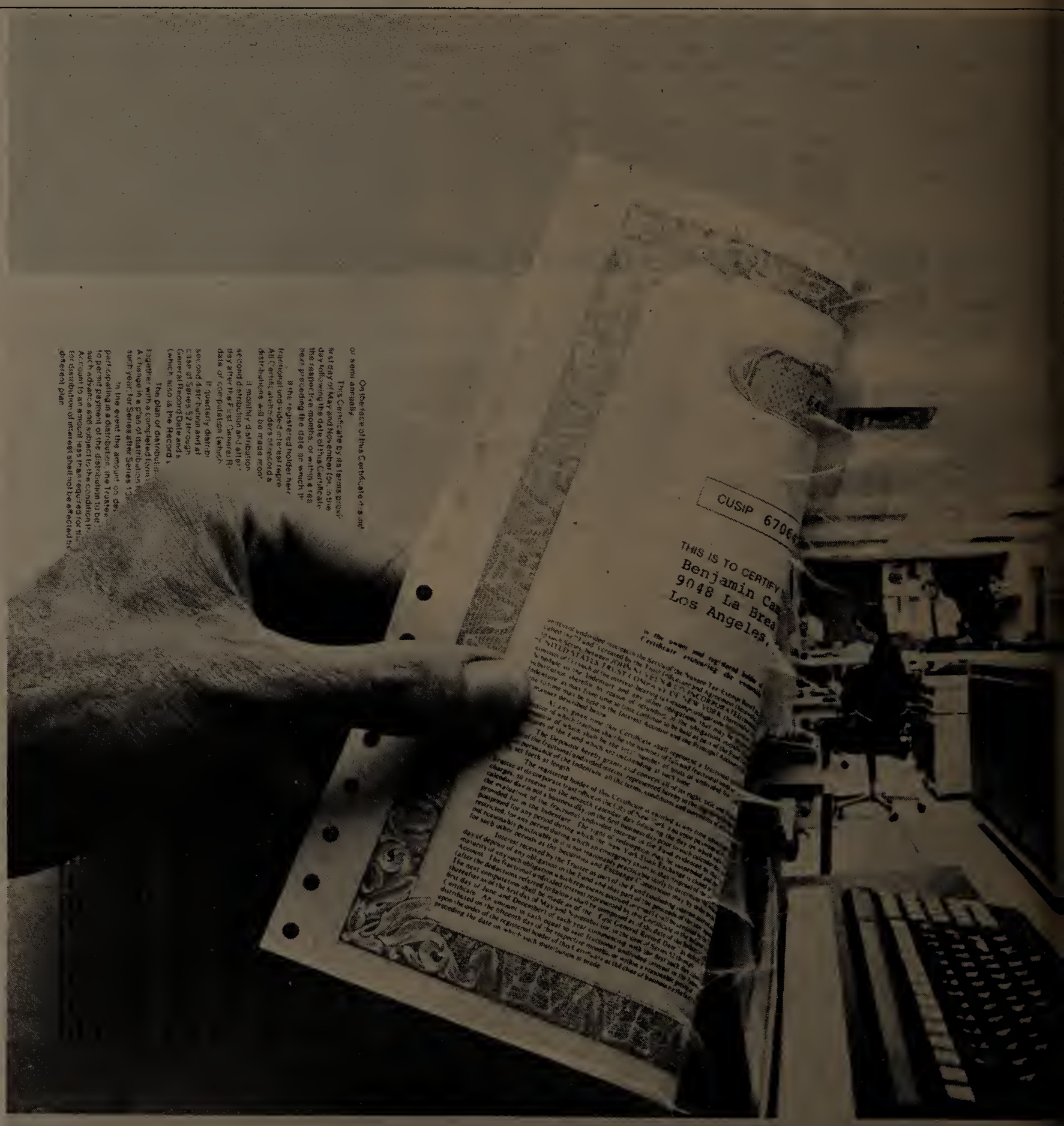
TOKYO — Hitachi Ltd. has launched three 8.8-in. storage products with memory capacities of 525M bytes per spindle. The products are called the H-6555-1 Type Disk Storage Drive, the H-6555-1 Type Disk Storage Control and the DK 815-5 Type Disk Storage Device. The first two devices, which are slated to be ready next March, are compatible with the vendor's M-220 and M-240 series of supercomputers and feature up to 2G bytes of memory. The third is an OEM product that will be available in November, according to the vendor.

■

TOKYO — Denno Co. has announced a contract with the People's Republic of China to open a computer training center in China to teach computer science and DP skills. Denno will supply the school with instructors, curriculum and all supplies, including microcomputers, office systems and peripherals. Denno will open the first of three schools by the end of the year in either Beijing, Shanghai or Kwangtung, a spokesman revealed.

SCOTLAND

GLASGOW — Scotland soon will be Europe's main producer of personal computers, according to Robin Duthrie, chairman of the Scottish Development Agency. The small northern country is already producing more microcomputers per capita than any other country in world, Duthie claimed. Additionally, Scotland reportedly hosts 11 of the U.S.'s top 20 electronics companies and has shown signs of emerging as the No. 1 provider of semiconductor products on the continent.



NUVEEN'S MAGIC BONDING AGENT

John Nuveen & Company needed something to hold it all together. Again.

The nation's largest investment banking firm specializing in municipal bonds and tax-exempt bond funds was being disrupted by dramatic changes in its business.

Traditionally, a limited number of banks and investment firms had comprised Nuveen's customer base, but starting in 1978 more and more individuals began investing in the bonds and Unit Investment Trusts handled by Nuveen. By early 1982, volume had doubled for the third time in five years and operations were overwhelmed by Nuveen's growth period.

"It was time, once again, for increased capabilities," comments John Claiborne III, Vice President and Manager of Information Services at Nuveen. "Basic Four equipment had come through for us twice before, so we went to them again. What we needed this time was a powerful super-mini that could crunch numbers at remarkable speed, that could handle all types of interactions during the day and batch action at night, and join together all of our terminals and national branch office network.

"It seems that whenever we had a need, MAI had an answer. This time it was their newly developed 8000 series."

Claiborne volunteered to "beta" test the new supermini in Chicago and within six months. "We had mastered

NEWS

Football star tracks fans, manages restaurant with computer

BAILEY'S CROSSROADS, Va. — Washington Redskins' quarterback Joe Theismann has found that he can build a mailing list for future business ventures while computerizing his restaurant here.

The football star, one of the owners of Joe Theismann's Restaurant, saw his daily fan mail as a business opportunity, according to restaurant manager Michael Kidwell.

Theismann wanted to keep track of his fans' names and addresses and found that it could be done on the Fortune Systems Corp. 32:16 multiuser micro that Kidwell installed at the restaurant late last year.

"With the Fortune 32:16, Theismann would be able to keep track of the daily business and accounting matters, as well as track supplies and inventories and even chart fan mail," Kidwell said.

In addition to maintaining a mailing list, the system has been used to generate response letters to fan mail through use of a data base that was developed in-house, Kidwell said.

But on a daily basis, the Fortune system is used for restaurant management. That task will grow in importance when the owners, Devil's Inn, Inc., doing business as Joe Theismann's Restaurant, open a second location.

"We do a lot of spreadsheet work. Right now, we're using it [to look] for a new location, comparing sites," Kidwell said.

He added, "One reason we bought the Fortune over the others is that we knew we wanted a second restaurant and wanted to be able to have users there send information back to the home office."

He uses Microsoft Corp.'s Multiplan spreadsheet for jobs like the search for a new location and for "pricing things out.

"I wasn't even sure we would use it when we first got the system. Now, I am continually creating new spreadsheet models. And every time an employee comes up with a new idea, we figure out a way to create a Multiplan model that will help implement the idea," Kidwell said.

Five employees

Approximately five restaurant employees, including Kidwell, the kitchen manager and the office manager, use the Fortune system. The system uses Fortune's For:Pro operating system, Unix and an accounting package from SMC Software Systems.

Kidwell reported that he puts several thousand transactions, averaging about $20 each, on the SMC general ledger each week. Although that ledger is not flexible enough to develop the reports that he needs, it facilitates entering numerous small transactions into the system, he noted.

Once entered into the ledger, data can then be transferred to Multiplan to produce accounts payable and other reports.

The restaurant also found the system useful for keeping track of which areas of sales — food and liquor — are most profitable, what method of payment customers are using and variables such as costs of goods to help establish pricing.

The restaurant, which Kidwell describes as upscale, offers full liquor service and seats 200 patrons.

With the desktop Fortune 32:16, based on the Motorola, Inc. 68000 microprocessor, the restaurant uses two terminals and a dot matrix printer supplied by Fortune and a recently added NEC Corp. 35 char./sec letter-quality printer.

the learning curve and optimized the system to fit our needs. It worked like a charm."

Today, Nuveen & Company's farflung and complex activities are tied together by two earlier Basic Four® systems plus two new MAI® 8030s. This high-capability equipment brings multiple advantages to the multiple tasks required by Nuveen:

- Fully configured with three processors, the MAI 8030 can support a large number of users. For Nuveen, the current hookup is 130 terminals with 100 of them on the two 8030s and the remainder on the earlier machines.
- The built-in system arbitrator balances Nuveen's demanding work load among the three processors to enhance the system's productivity.
- The system is hardware independent, allowing Nuveen to upgrade hardware or operating system software as technology advances.
- The powerful 32-bit systems provide speed and ease of operation.
- Each 8030 can handle multiple tasks simultaneously.

"Handling billions of dollars in investments means handling thousands of transactions," Claiborne concludes, "and the 8030 is up to our needs today and for the foreseeable future."

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TANDEM

NonStop Transaction Processing

OA system helps Dolby streamline document production

SAN FRANCISCO — Dolby Laboratories, a manufacturer of electronic noise-reduction systems here, realized in 1981 that it had outgrown its office automation system, which consisted of two stand-alone Xerox Corp. 850 information processors and Accusoft, Inc.'s Z-Word word processing software, which ran on an IBM System/34 minicomputer.

"Although this system served us well at one time, our growing publication requirements were outrunning our word processing capacity," Dolby's MIS Director Michael Ham explained. "Time-consuming and costly steps of production and typesetting were increasing. Our secretaries' work load had also reached the breaking point. We needed a way to streamline our production of documents at all levels."

After an assessment of the available office automation systems, Ham and Dolby President Bill Jasper decided in October 1981 to install a Xerox Corp. 8000 network. The primary reason for selecting this system was that it supported the Xerox 8010 minicomputer and the Xerox 8044 laser printer.

"No other system could produce typeset-quality documents that integrated both extensive text and sophisticated graphics," Ham said. "Another benefit the network offered was that users of [Digital Research, Inc.] CP/M or [Microsoft Corp.] MS-DOS-based microcomputers could be incorporated into the system."

Since 1981, the network has grown so that it now includes three Xerox 8010s; three 860 information processors; a laser printer; a file server and communications server, with 80M bytes of disk storage; and 35 IBM Personal Computers and North Star Computer, Inc. Advantage micros. Many routine documents are printed on 12 Diablo Systems, Inc. 630 daisywheel printers linked to the Advantage micros.

In addition to their role in the 8000 network, the microcomputers communicate with a newly installed IBM System/36 via an IBM Series/1 protocol converter, which also sends telexes.

The system serves a number of users: Dolby executives and managers type and send memos via electronic mail; engineers interactively design and print schematic diagrams; technical writers create illustrated user manuals.

Preparing text

Typically, users write the text for many documents — including proposals, manuals, system documentation, journal articles and detailed meeting agendas — on the Advantage micros with Micropro International Corp.'s Wordstar, Ham said. After transmitting the text to an 8010, the user can reformat the text, enhance it with a variety of typefaces and sizes and merge it with graphics created on the 8010. The document is sent to a Xerox laser printer that produces either a finished publication or camera-ready copy for typesetting.

"Because the preliminary work can be done on the Advantages, the network increases the productivity of the more expensive Xerox 8010 and 860 systems," Ham said.

He noted that the network enables users to transfer files to one another easily or to transmit files to the 8010s or 860s, where they can be merged into a single document. If further modifications are needed, files can be downloaded from the Xerox machines to the micros.

Dolby's network links a wide variety of equipment distributed throughout two floors of the firm's building. More than 750 feet of ½-in. Ethernet cable carries data to the network's devices at a rate of 10M bit/sec.

Speed is one of the few problems that Dolby experienced with the network. "Transmission speed is a little slow," Ham said, adding, "Since the system was first installed, its speed has significantly increased."

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NEWS

Graphics tool brings speed, accuracy to surveyor's job

QUANAH, Texas — The discovery of oil in East Texas in 1930 had little to do with scientific prospecting. Pure, blind-luck drilling flooded the U.S. oil market and made the East Texas oil field the largest oil producing area in U.S. history. In less than 50 years, four billion barrels were pumped out of miles and miles of ranch land, with another two billion barrels left in reserve.

Oil is big business in the U.S., which produces 90% of the world's oil wells and 16% of the world's oil, and the entrepreneurial spirit plays an important role. Gary Naylor, president of Engineering Surveys, is the only surveyor registered at the courthouse in Hardeman County, Texas. Operating out of Quanah, (population 3,948) directly southeast of the Oklahoma panhandle, Naylor does 60% of his business in the Texas oil fields with leading oil firms and independent investors.

As important to his work as his surveying telescopes and angle-measuring instruments is a graphics plotter, which produces a hard-copy record of the surveying measurement data he inputs into an IBM Personal Computer. The plotter, a Hewlett-Packard Co. Model 7470A, provides multicolored maps, charts and graphs of his surveying data on paper or transparent film. The primary use of the plotter in Naylor's civil engineering and surveying business is for producing oil well location plats or for mapping out sections of ground.

Playing by oil field rules

Much happens before Naylor is called out on the oil field to take his measurements and record the data in graphics form. "When a company or an independent group of investors comes into the county to try their luck, they play by the rules," Naylor said. "First, they lease land from a Hardeman County rancher or landowner. Before they start contracting to drill a wildcat [well], they shake hands and sign papers with the landowner, who receives a royalty for his mineral rights, which might be one-eighth of the sale value of the oil produced."

The U.S. is the only major oil producing country where oil in the ground belongs to the landowner and not to a government agency. In contrast, the Bolivar coastal field in Venezuela, which produces more oil than any other field in the world, is government-owned. The Persian Gulf states (Iran, Iraq, Saudi Arabia, Kuwait, Bahrain, Qatar and the United Arab Emirates) produce 56% of the world's oil reserves, all government-owned.

On the other hand, drilling for oil in Texas is a many-partied venture with many independent speculators. Persistence, good planning and luck can pay off well.

According to Naylor, chances are good in Hardeman County. "We're a small county, but there are a lot of good wells. On the average, the county can pull in 50 to 75 barrels a day, but on a very good day, it's been known to bring in 300 barrels. The risk is that for every wildcat well that produces oil, there are about five dry wells."

Oil speculators compile geological and geophysical data on the land they've chosen by hiring a seismic company to detonate dynamite charges and record the resulting vibration readings. The location of faults is determined, and — on cue — Naylor goes out into the field and sets up his tripod and field equipment.

Once he measures and records his data, he takes it back to the office and inputs his measurements into his IBM Personal Computer. Using Autodesk, Inc.'s Autocad graphics software package and his own lettering program, he is able to draw the lines, arcs, letters and other shapes on the screen for the plat drawing. He then instructs the plotter to produce the plat on paper to show the result of his measurements, from which a plan or boundary description can be made.

Time savings

"There is no question that the plotter saves me an incredible amount of time," Naylor said. "The traditional surveying method was to draw out measurements and lettering gathered from transits and theodolites. With the plotter, I can do the same plat with more precision and ease of programming and labeling and 10 times faster than the old way."

Once the plat is shown to the hopeful investor or oil company representative, he is able to see clearly how far from the property to lease lines or the number of feet from specific locations to the wells.

"The quality of the plots are very impressive and professional looking, and this reflects on my business," Naylor said.

"If I can make my clients' job simpler by presenting measurement data in an easy-to-read format, then everyone involved in the wildcat well will clearly understand the land surveying data, and they can move on to the next step of setting up a rotary drilling rig. After all, a favorable drilling location may be indicated by scientific method, but it's the drill that gives the final answer," he said.

'In these parts, finding a computer retail store is difficult, so I sent for a plotter through mail order.'
— Gary Naylor, president, Engineering Surveys

Naylor said that he first saw the plotter demonstrated at the Texas Surveyors Association conference in Wichita Falls, Texas. "I was impressed," he said. "Here was this . . . desktop plotter that could make my surveying easier, and . . . it could interface with my IBM Personal Computer, which I use for other business operations, and had preprogrammed graphics commands. Although I was able to create my own lettering program for the plotter, my strongest expertise is land surveying and engineering — not computer programming — so I was pleased that I could learn to use it quickly.

"In these parts, finding a computer retail store is difficult, so I sent for a plotter through mail order. My business hasn't been the same since," he said.

"The use of a plotter in land surveying is a little like the big improvement made in oil drilling technique when rotary drilling — or revolving a steel bit at the bottom of a hole — was discovered as a better alternative to old-fashioned, cable-tool drilling, which pulverized the rock by raising and dropping a heavy cutting tool.

"In a similar sense, the plotter replaced the old-fashioned method of drawing out all my data by hand," Naylor said. "And this makes the whole project of helping my clients find oil less complicated."

Surveying and drilling for oil will continue to be big business in Texas. Since its discovery first prompted the Texas governor to send out the militia to regulate production in the early '30s, oil has attracted oil companies, investors and landowners to sign agreements to set up their oil drills. Independent surveyors such as Naylor, in the midst of the millions of dollars reaped in Texas, will set up their field equipment and find better ways of presenting their land surveying data.

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NEWS

Video monitor displays wealth of bank information

Micro-based system keeps customers current on interest rates, products, services

FORT WAYNE, Ind. — With ongoing changes in banking regulations, financial institutions need to update interest rates constantly on various financial products, a bank headquartered here discovered.

Lincoln National Bank, which has $750 million in assets, found that posting the latest rate information became a major operational challenge until it installed a microcomputer-based system that displays rates on a color video monitor.

The automated system, based on a Sony Communications Products Co. SMC-70 microcomputer, has replaced the manual rate board at Lincoln National and, according to bank officials, has opened new marketing avenues for the bank.

Computer graphics are displayed on 19-in. monitors in each of the bank's 13 branches, illustrating the latest rates and promotional information on a range of products and services. The presentation is punctuated at regular intervals by a computer-generated version of Lincoln National's logo — a silhouette of the bank's headquarters tower.

Deregulation prompts action

"We just got to thinking, why couldn't we display the latest rates like they do flight numbers in airports — on a television screen? While we thought that was a great idea, it took Oct. 1 to really bring it home," said Randolph F. Williams, vice-president and director of marketing for the bank. He noted that Oct. 1, 1983 was the day that federal officials completed deregulation of deposits at financial institutions, and the problem of posting rates was magnified.

Last fall the bank bought the information terminals, which consist of an SMC-70 graphics computer with a single disk drive and a Sony 19-in. red-green-blue color monitor. The video display program was custom-made by Bytrex, Inc., a computer dealer here.

Williams said that current rate information is entered using the keyboards in branch banks. He said the system features the ability to tie accounts to indexes that change as often as three times a day.

Marketing officers design screens to promote products and services with and without emphasis on pricing, using 16 colors assigned independently for text, background and borders. New screen designs are delivered on diskettes to the various branch banks, although updated rates can be entered by keyboard at the branches.

'Blue-light specials'

Williams said the terminals have been used to promote "blue-light specials," like those offered by retail chains, with the bank boosting limited-time opportunities to buy specific products.

"Today's customer has many banking opportunities to choose from, not just a checking and a savings account. Customers can design their own certificates of deposit to match their investment needs. We wanted to solidify our customer base and help depositors make the best investment decisions. To do that, we needed to offer financial information along with competitive rates. Now we can do that with flashing lights," Williams said.

He added, "Whether a bank in our market gets new business depends on how it advertises and promotes its products. We want our customers to rely on us — through the video rate board — for new product information and pricing schedules."

NAE meet set for Oct. 4

WASHINGTON, D.C. — A group of executives and educators will present a free symposium Oct. 4 on information technologies and social change at the National Academy of Sciences auditorium here.

The symposium is sponsored by the the National Academy of Engineering (NAE) and will be held in conjunction with its annual meeting.

Speakers at the symposium will discuss new information technologies and their influences on society, according to a spokesman for the NAE.

Papers will be presented at the symposium by John Mayo, executive vice-president of network systems for Bell Laboratories; Melvin Kranzberg, professor of the history of technology at the Georgia Institute of Technology in Atlanta; and Harlan Cleveland, director of the Hubert H. Humphrey Institute of Public Affairs at the University of Minnesota in Minneapolis.

Also scheduled to present papers are Theodore Gordon, president of the Futures Group; Walter Baer, director of advanced technology for the Times-Mirror Co.; and Anne Branscomb, an attorney and consultant.

Topics of the papers will range from "The Evolution of Information Technologies" to "Information Technology and Changing Concepts of Property Rights."

The symposium begins at 10:30 a.m.

Further information is available from the NAE, which is located at 2101 Constitution Ave. N.W., Washington, D.C. 20418.

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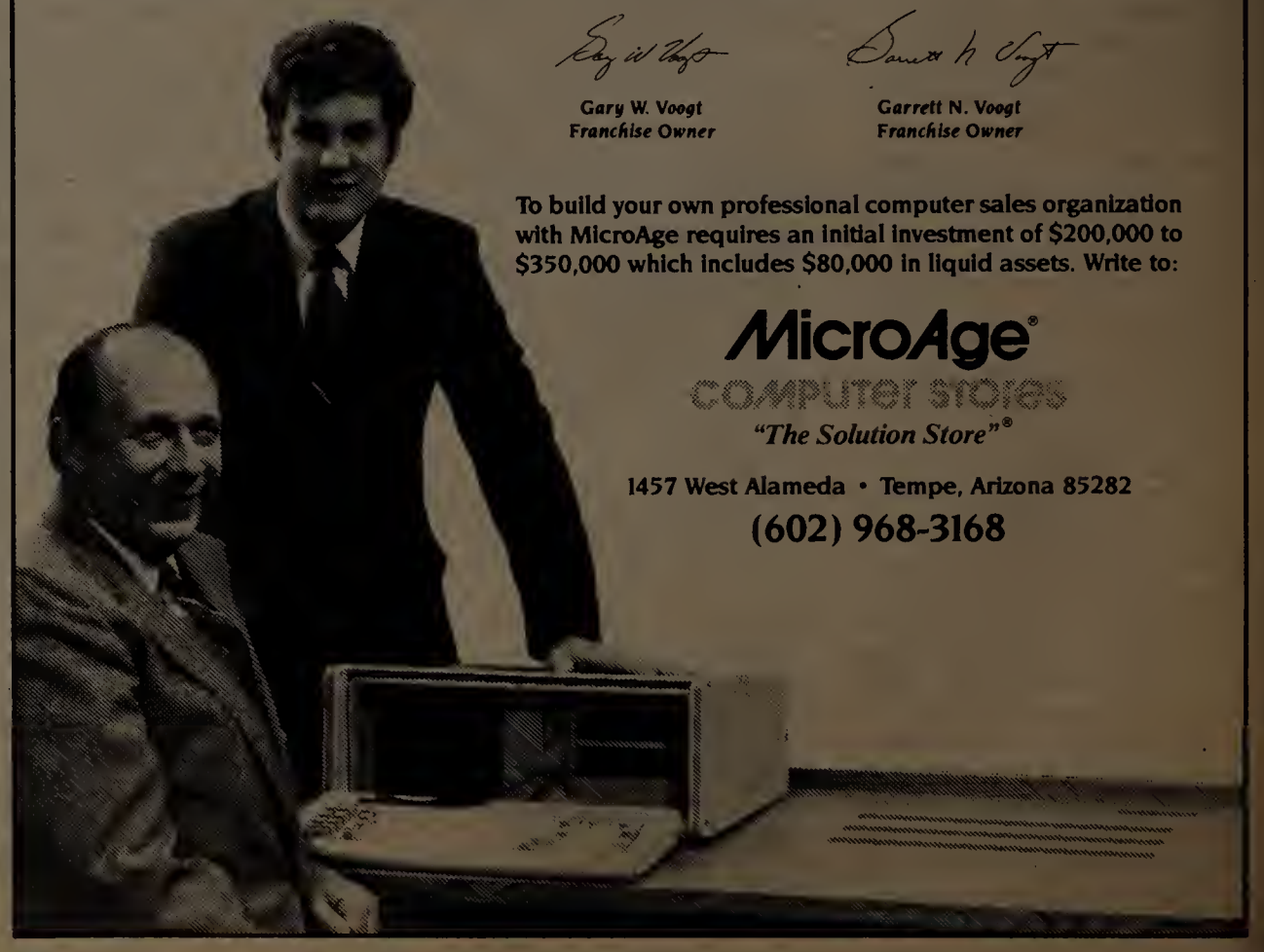

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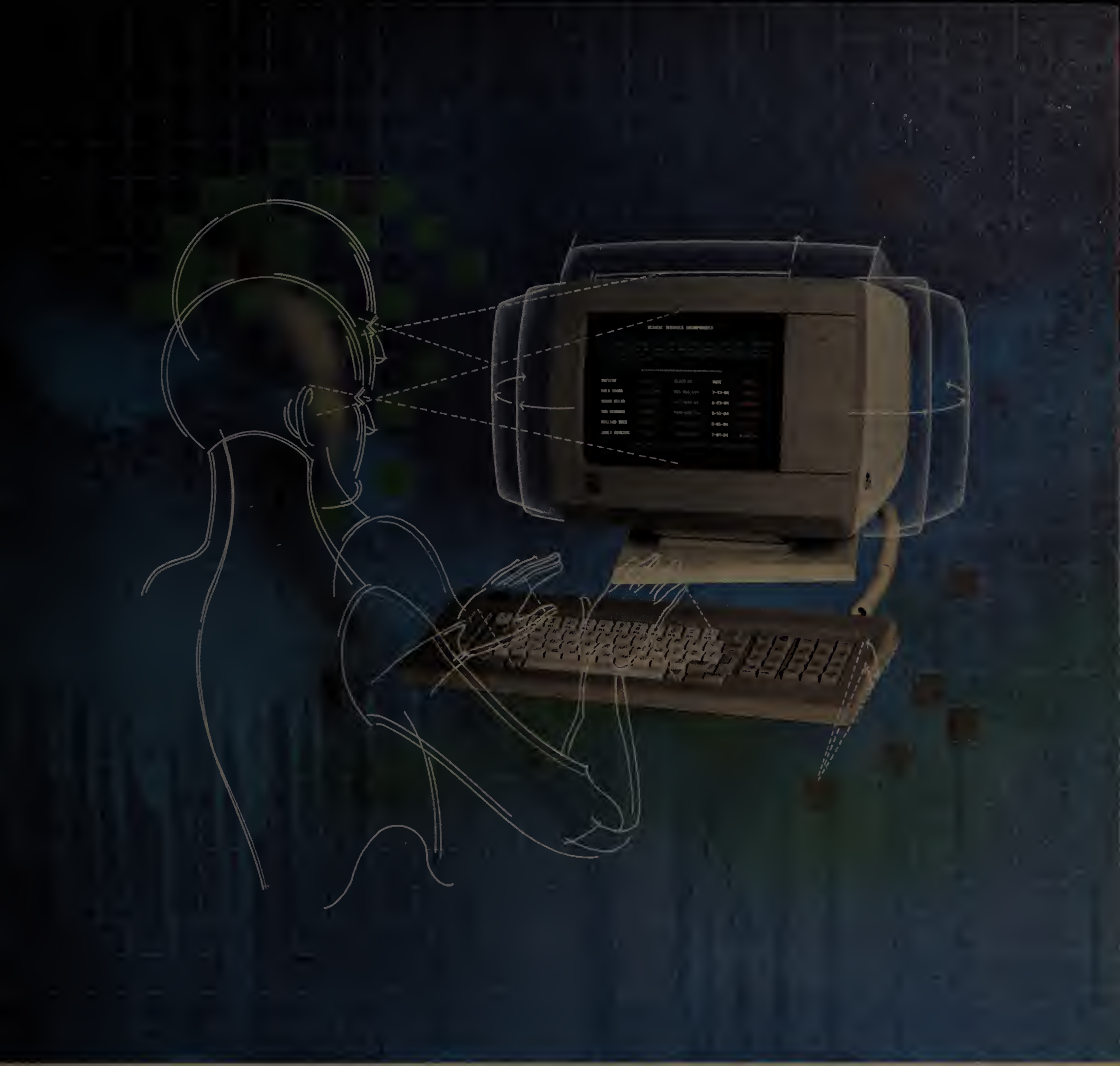

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Directory Lists 16,000 N.Y. Users

NEW YORK- The 4th edition of the 1984 Directory of Computer Installations, lists 16,000 computer users in NY, NJ & CT.
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NEWS

Airline alters course with crew scheduler

ST. PAUL, Minn. — Northwest Orient Airlines, Inc., headquartered here, outgrew its principally manual flight crew scheduling system.

Crew schedules represent one of the most complex facets of the airline industry: flight schedules, routing of aircraft, contractual limits and Federal Aviation Administration regulations have to be linked in a cost-efficient manner.

"The system was more than 10 years old and had very limited functionality," said David Quanbeck, Northwest Orient's director of commercial systems.

Last summer, the company began evaluating a number of vendors' systems. "There were a few packages available, but only one ran on the hardware that we have," Quanbeck noted.

Because the airline already uses a Sperry Corp. 1100/83 mainframe, it decided to purchase, earlier this year, Sperry's Airline Pairing and Planning System (Alpps).

Using flight schedule, aircraft routing and station files entered by schedule analysts, Alpps allows the analysts to construct profiles that accommodate contractual and scheduling rules, according to Quanbeck.

The interactive, menu-driven system helps to ensure that the schedule analysts construct the most efficient schedules possible.

One Alpps feature provides the schedule analyst with flexibility in listing flight legs: breaking flight legs apart by station or flight, correcting legs by station or flight, editing data files and requesting a listing of all flights into and out of a station.

> *'I think we are processing data in a more efficient manner.'*
> — David Quanbeck, Northwest's director of commercial systems.

With these functions, a schedule analyst can observe and gauge the effects of changes on a number of schedules.

"A major Alpps feature is the manner in which the system handles the switch from one month to another," Quanbeck said.

"Crew schedules are designed on a monthly basis: When the month changes, transferring schedules smoothly can be a complex task. This system has a tremendous amount of flexibility and is able to move smoothly from one month's schedule to the next one," Quanbeck said.

Quanbeck reported no major installation problems with the system. "There were the usual minor problems," he said. "As we are becoming more familiar with the system, fewer problems are surfacing."

With the advent of Alpps, Northwest Orient expects more efficient utilization of crew-members and, consequently, reduced crew expenses, Quanbeck asserted.

"I think we are processing data in a more efficient manner and more quickly, and this saves us money," Quanbeck said.

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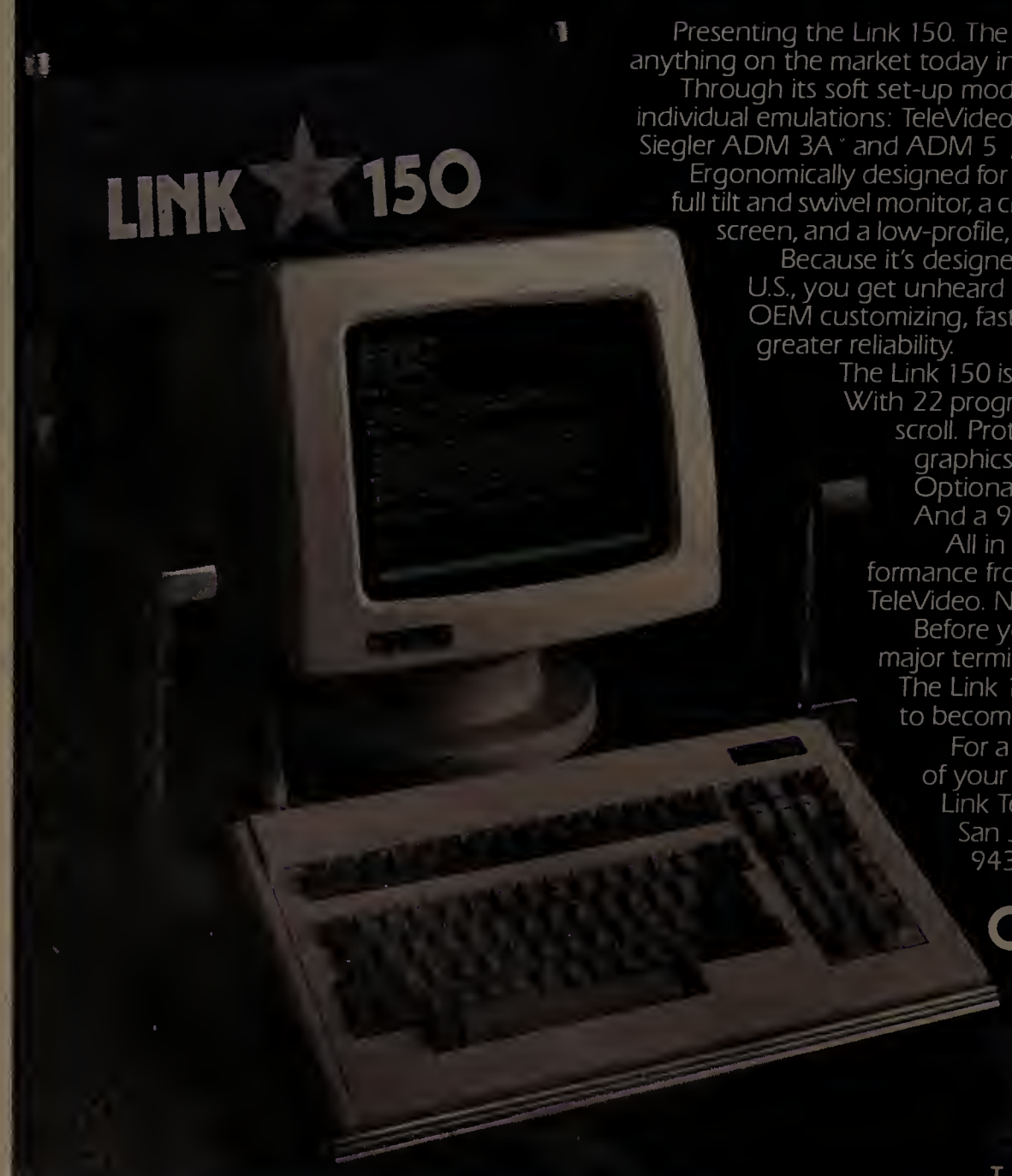

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NEWS

3M halves development time with data base machine

ST. PAUL, Minn. — An electronics supplier has reportedly cut its product development cycle time in half by turning to a data base machine to make manufacturing and inventory data available to its computer-aided design (CAD) systems.

The revised method of data dispersal was recently adopted by 3M Co.'s Electronic Mechanical Resources Division, which provides in-house CAD services for the 12 business entities that constitute 3M's Electronic and Information Technology sector.

Part of the division's job is to supply the company's engineers with manufacturing information such as bills of material, parts descriptions and vendor price quotations, all of which are required for the design of 3M's new products.

Parts descriptions, for example, are routinely retrieved from the division's data base and incorporated into engineering drawings produced by the company's assortment of CAD systems.

Time-sharing service

In the past, the division maintained its manufacturing information externally in an independent time-sharing service. The rest of 3M's CAD resources resided in-house, according to Rod Schmuland, the division's supervisor of software development.

Although the company's engineers could gain access to the time-sharing service through a local terminal, the internal CAD systems and the external manufacturing information were completely unintegrated — a shortcoming that sometimes had serious repercussions.

When, for example, designers needed to add parts descriptions to their engineering drawings, they had to leave their CAD stations, walk to the time-sharing terminal, electronically fetch the desired information and then transcribe it.

The process proved time-consuming and cumbersome. It sometimes resulted in transcription errors or omissions that found their way into 3M's engineering designs and ultimately manifested themselves as flaws in the company's finished products, Schmuland said.

Use of the time-sharing system also proved to be extremely expensive. "The annual time-sharing bill that was run up by just one of the divisions to which we provided CAD services totaled more than $180,000," Schmuland recalled.

Costly endeavor

In the end, the time-sharing system became so expensive to use and contributed to so many costly product defects that the division was left with no choice but to scrap it.

At first, 3M considered replacing the time-sharing service with a general-purpose minicomputer that would reside in-house and would be configured with a data base management software system. But the suggestion "was rejected out of hand," Schmuland said.

"A minicomputer wouldn't have been generic enough" to interconnect the division's variety of CAD systems, each of which is built around a different vendor's host processor.

One of the division's CAD services specializes in mechanical design work, while a second performs electronic engineering and a third is used for developing hybrid integrated circuits.

3M also briefly considered replacing the time-sharing service with a group of data base management software packages that would reside locally inside each of the division's major CAD systems. But that alternative, too, was nixed because the proposed software "would have consumed too many CPU cycles that the division had reserved for other, more important purposes," Schmuland said. "Our CAD systems exist to do drawings and geometry, not to do data basing."

In the end, the division decided to remove its manufacturing information from the time-sharing service and transfer it instead to a back-end system that the division recently installed internally. The system is built around a Britton-Lee, Inc. IDM 500/2 relational data base machine.

"The primary benefit is improved product quality and decreased development times," Schmuland said. Since bringing its manufacturing information in-house and integrating it with the existing CAD systems, 3M "has been able to cut its product introduction cycles in half. In other words, a product that under the old system took us six months to bring to market now takes us only three months."

Schmuland ascribes the compressed turnaround to a drop in design errors and to a resulting decrease in the company's product defects, which require time-consuming corrections and thus can significantly delay an item's market entry. The cut in design flaws he attributed to the elimination of the clumsy, error-prone practice of transcribing parts descriptions from one system and entering them into another.

In the future, Schmuland predicted, the division will attach additional CAD systems to its in-house data base system.

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Disk processor speeds firm's software distribution

Automatic machine cuts diskette duplication time for Big Eight accounting company

NEW YORK — An automatic diskette processing machine has solved a nagging microcomputer software distribution problem for one Big Eight accounting firm.

Coopers and Lybrand has been developing business software at its headquarters here for internal use by its branch offices for more than 20 years. The company has also been selling its software externally for 15 years.

The firm's software focuses on auditing and accounting, business planning and financial planning, statistical sampling and analysis and tax planning analysis.

According to Stanley Halper, national director of Coopers and Lybrand's computer audit assistance and national electronic data processing group, the company two years ago introduced micros to its branch offices for its accountants to use in handling client cases.

Software for accountants

To supply the accountants with applications software, the company employs more than 100 programmers, who develop programs on an assortment of more than 20 brands of micros, including IBM, Apple Computer, Inc. and Tandy Corp.

But, Halper said, a problem arose when copying the program diskettes for distribution to branch offices worldwide — a task that required one clerk's full-time attention — became a massive bottleneck.

"Copying the diskettes efficiently was our central concern," Halper said. "We have 100 offices, and each office requires an average of 10 of our software products. The products are subject to constant modification due to shifts in government regulations or because of ordinary updates generated by internal policy or procedural changes.

"If we make a change, it means there are at least 1,000 diskettes that have to be generated again," he said. "We had a large duplication problem."

Automatic diskette processor

After reviewing a variety of automatic duplication equipment, Coopers and Lybrand selected Irvine, Calif.-based Media Systems Technology, Inc.'s Model 100Y-2 automatic diskette processor.

Halper said the system consists of a disk drive with a feed mechanism for automatically inserting diskettes for read or write functions. The drive processes the diskettes into one of two bins for either accepted or rejected diskettes.

The unit is connected to Coopers and Lybrand's Zilog, Inc. MCZ-250 microcomputer, to which it appears as a normal 8-in. disk drive. The micro controls the loading and unloading of the diskettes through an 8-bit parallel loader interface.

The loader itself uses a modified version of the Zilog program that formerly enabled the Coopers and Lybrand operator to manually copy diskettes.

No operator intervention

Halper said the Model 100Y-2 automatic diskette processor incorporates a stacking capacity of up to 50 diskettes for processing any format or density — single- or double-sided — without operator intervention.

The loader's automatic operation allows operators to stack and remove diskettes without interrupting the copying process, and individual diskettes can be sequenced through both load and unload cycles by use of control and status indicators provided on the loader's control panel.

"The major benefit of the loader is that we do not have to hire a full-time person to operate the machine," Halper said. "That has more than compensated for the cost of the unit. It gives our people the ability to start up a program and just walk away. And the system can do in one day what used to take three days to do manually. We can put in 50 diskettes and just ignore the system."

For 15 years, Coopers and Lybrand has been selling its software to external users via the General Electric Co. American Institute of Certified Public Accountants catalog. The company is now the largest supplier of accounting, auditing and tax software in the GE network.

Micro software marketplace

The company also decided to enter the micro software marketplace in 1982, offering products in eight categories. The products consist of anywhere from five to 10 diskettes, depending on the application and the host system.

Halper said the company intends to purchase another Media Systems Technology processor to support external micro software sales.

"We wanted to carry over the policy of providing quality products into the software we sell on the open market," he said. "The sheer size of the task compels us to continue the automation process of which the diskette processor is an integral part."

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NEWS

Micro software helps clothing chain boost sales, control inventory

BATON ROUGE, La. — Todd Garland, owner of a six-unit chain of specialty clothing stores here, attributes much of his profitability to aggressive retail inventory control using microcomputer software. "This year, we cut our inventory by nearly half and still increased our sales. Needless to say, we had an outstanding profit picture," he said.

As the business grew, he said, "We needed greater analytical capabilities in evaluating our inventory," prompting the conversion from a manual to a microcomputer-based system of inventory control at RFD, Inc./Todd Garland & Co.

"Our radical reduction in the amount of inventory . . . results from the new system's ability to eliminate overbuying and its ability to allow us to set an absolute limit on the amount of slow and dead merchandise that we tolerate in each class before taking corrective action," Garland explained.

The new system is an IBM Personal Computer running the Automatic Execumatic System from Execumatic, Inc. of Westwood, Mass. The software is designed to evaluate merchandise performance based on return on investment, much as one would analyze the return on investments in the stock market.

Denise Fondren, inventory control manager for the stores, said the Execumatic software was purchased because it was designed for retail clothing operations. A single copy of the software costs $5,000.

For Garland's stores, the Execumatic reports show the profitability of four categories of merchandise — dead, slow, active and hot — and the clothing styles in each category. Once identified, the manager can shift inventories and make buying decisions to boost profits.

Garland's six clothing buyers can analyze their inventories continuously, mark down the prices on styles that are in the dead or slow categories, identify customer purchasing trends quickly and replenish hot styles with confidence, he said.

Because certain clothing styles sell better in some locations than in others, the Garland stores also use the Execumatic reports to take fast action to move merchandise where it will sell best, Fondren added.

The Execumatic productivity reports provide an analysis of each store's sales volume, customer traffic and profits, enabling each store manager to monitor his own performance and keep an eye on his colleagues. According to Garland, this has spawned a friendly rivalry among the managers that has them clamoring for merchandise to replenish their sellouts.

Garland and Fondren said installation went smoothly, largely due to simple instructions, good vendor support and a training program for all Garland buyers and managers. "The effort in time and money really paid off," Garland said of the training program.

Oct. seminar to cover links

WASHINGTON, D.C. — Linking microcomputers to mainframes for use in business and government will be the topic of a three-day seminar sponsored by the National Institute for Management Research, Oct. 24-26 at the Sheraton National Hotel here and Nov. 14-16 at the Chicago Marriott.

"Personal Computers in Business and Government — The Micro-Mainframe Connection," will examine the impact micro-mainframe links have on jobs, careers and organizations.

Registration for the seminar is $595. More information is available from the Public Relations Department, National Institute for Management Research Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

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NEWS

Motel has no reservations about automated booking system

ABERDEEN, S.D. — Guests who call Super Eight Motels, Inc.'s toll-free reservation center here are getting faster service, thanks to the economy motel chain's conversion from a manual system to a fully automated reservation system.

For the motel chain, the key to a smooth and successful transition to the automated system was careful attention to how workers actually take customer reservations and then matching that system flow in the software, according to Mike Kistner, Super Eight's director of management information systems.

When rapid expansion in the chain prompted the decision to automate reservations, Kistner began his search for a reservation system that would mesh with Super Eight's needs. But unable to find what he called "a good fit," Kistner hired an outside consultant, Walter Ewell of Motel Industry Computer Applications, Inc. of Virginia Beach, Va., to select the hardware and to design the reservation system.

Ewell and Kistner narrowed the hardware search to two companies able to provide service support to the headquarters here. Ultimately, Super Eight chose Data General Corp. and its MV4000.

Reasons for buying

Kistner said he preferred the MV4000 from DG for several reasons:

- The multiple channels and individual logical disk structures of the MV4000 have advantages for emergencies. "In the event of a disk drive failure," he noted, "we could move our backup packs around, bring up a different version of our operating system utilizing the remaining good drives and still be functional."
- Super Eight was able to transfer accounting software and data files on its existing DG CS50 to the new MV4000 without costly conversion steps, and then it sold the CS50.

Next, Ewell and Kistner worked to redesign the reservations system, using DG's 32-bit Cobol and Infos II data base file structure, and geared the system to Super Eight's customary reservation-taking procedure.

Custom design

"Ewell designed our system flow around the way in which a reservationist actually takes a reservation, rather than the way a data processing person would perceive as the most efficient and effective way to attack the problem," Kistner said.

"Keeping in mind the logical flow of a reservation, the software is designed to give the reservationists only valid options and information at the time they are called for in the dialogue. In this way, the reservationist is actually passively prompted through the reservation in a natural flow," he explained.

The payoff for this custom design was that several agents averaged more than 30 calls per hour on the first day they worked with the new system. In addition to pleasing customers, the service has also saved money on Wats line charges, Kistner said.

The reservation automation project was completed, Kistner said, with the help of Eagle Software, Inc. of Salina, Kan., in writing report and file maintenance programs.

The next step, he said, is to develop one-way communications with each motel to transmit the reservations via dial-up and autoanswer modems and printers.

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In-house system provides handle on growth for pump maker

ROCKFORD, Ill. — A hydraulic pump manufacturer, which once was admittedly reluctant to take the plunge into computerization, said the recent installation of an in-house computer system has significantly enhanced its ability to manage its growth.

Fenner Stone, Inc. had been handling its financial and inventory operations manually for 15 years before deciding in 1978 to take an initial step toward automation.

At the time, the company was overloaded with data and found itself faced with the choice of either hiring more workers or turning to computers.

Because the company had survived for 15 years without computers, it was reluctant to jump "completely into" information systems, according to Jerry French, Fenner's systems manager.

Xerox contract

The company contracted with Xerox Computer Services, Inc., the computer leasing service group of Xerox Corp., for a time-sharing agreement. Fenner initially used the Xerox service for financial applications, adding other applications later.

"Going into time-sharing with Xerox meant we could have our information much more quickly, such as processing our accounts receivables more quickly and, therefore, being able to collect money more quickly," French said.

In June 1983, because of the company's steady growth, Fenner decided to leave the time-sharing environment and move to an in-house computer.

"The volume of our transactions is extraordinary," French said. "We had to abandon the time-sharing relationship and bring a turnkey system in-house.

"The requirements of our data processing [department] are increasing," he continued. "We have more printouts and historical types of information to be stored on computers, which becomes cost-prohibitive in a time-sharing environment.

"With time-sharing, we had to look at things on a rising-costs basis instead of the fixed-costs basis that we can do by having our own system. We simply outgrew ourselves in the time-sharing environment," French said.

In its past time-sharing environment, Fenner had four terminals existing in a centralized operation, and, according to French, users never really got involved with on-line systems. However, the time-sharing system did help to ease the company's transition to its own computer system, he said.

Fenner looked at several other options before making its final choice, including hardware options from IBM and Hewlett-Packard Co. and software from Cullinet Software, Inc.

French said the company decided on the Xerox software because the conversion costs would be far less than with the other alternatives. "From a user's standpoint, there was no conversion.

"When it came time to make the transition, from the applications side there simply was no conversion needed," French said. "For instance, Xerox copied the data base we used in the services environment onto tape and just loaded it into our in-house system.

The company decided to go with a turnkey software package from Xerox called Transaction Manager.

Fenner also purchased an IBM 4321 mainframe with two IBM 3370 disk drives containing 570M bytes of memory each. The firm uses 21 IBM 3178 terminals and 10 IBM 3287 workstation printers.

Fenner uses the software for financial, inventory and other applications.

The in-house system has done all the company hoped it would, French said.

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NEWS

Firm builds productivity with switch from Cobol to applications tool

LOS ANGELES — An engineering support contractor said it has experienced a 400% productivity gain in application development and maintenance after switching from Cobol to a fourth-generation, nonprocedural language for a large-scale program development project here.

The software engineering division of Mantech International Corp., headquartered in Washington, D.C., does custom software development, mainly for large integrated data base systems.

Mantech decided to make the change from IMS and Cobol to Informatics General Corp.'s Mark V application development software about a year ago.

"We were approached by a customer with a very large IMS application development project that was a year behind schedule," said Louis H. Ray, executive director of the software engineering division. "Based on savings we expected to achieve using Mark V, we were the low bidder and won the contract to do the whole job."

Ray noted that Mantech had previously looked at another application development tool — IBM's Application Development Facility (ADF) — before deciding on Mark V. "We felt that the primary problem with ADF was the system performance overhead associated with it," he said.

"Because it's an interpretive rather than a compiled language, we felt the performance penalties associated with that type of language would be prohibitive."

Following the awarding of the development contract to Mantech in June 1983, Ray and his colleagues set up an office in Los Angeles near the customer's site and, by August, hired 50 programmers.

Mantech acquired the Mark V package and began training its staff in August. The training was completed by the end of September, and by the first of October, the company began implementing its first subsystem.

The first of 11 subsystems, consisting of 39 on-line screens and 12 report programs, was completed in mid-December. During the 75-day effort by four programmer-analysts, all of the on-line applications were done exclusively in Mark V, with Cobol used only to write two batch programs.

'Marked reduction'

"The primary benefit we experienced from using Mark V instead of Cobol for this IMS application," Ray said, "was the marked reduction in the elapsed time needed to implement an on-line message processing program.

"Using Cobol, this task had typically taken five to eight weeks per screen. With Mark V, the same job took an average of one to two weeks per screen," Ray said.

According to Ray, the shortened, per-screen implementation period makes it possible to meet very tight deadlines by assigning one program to each individual.

Improved documentation

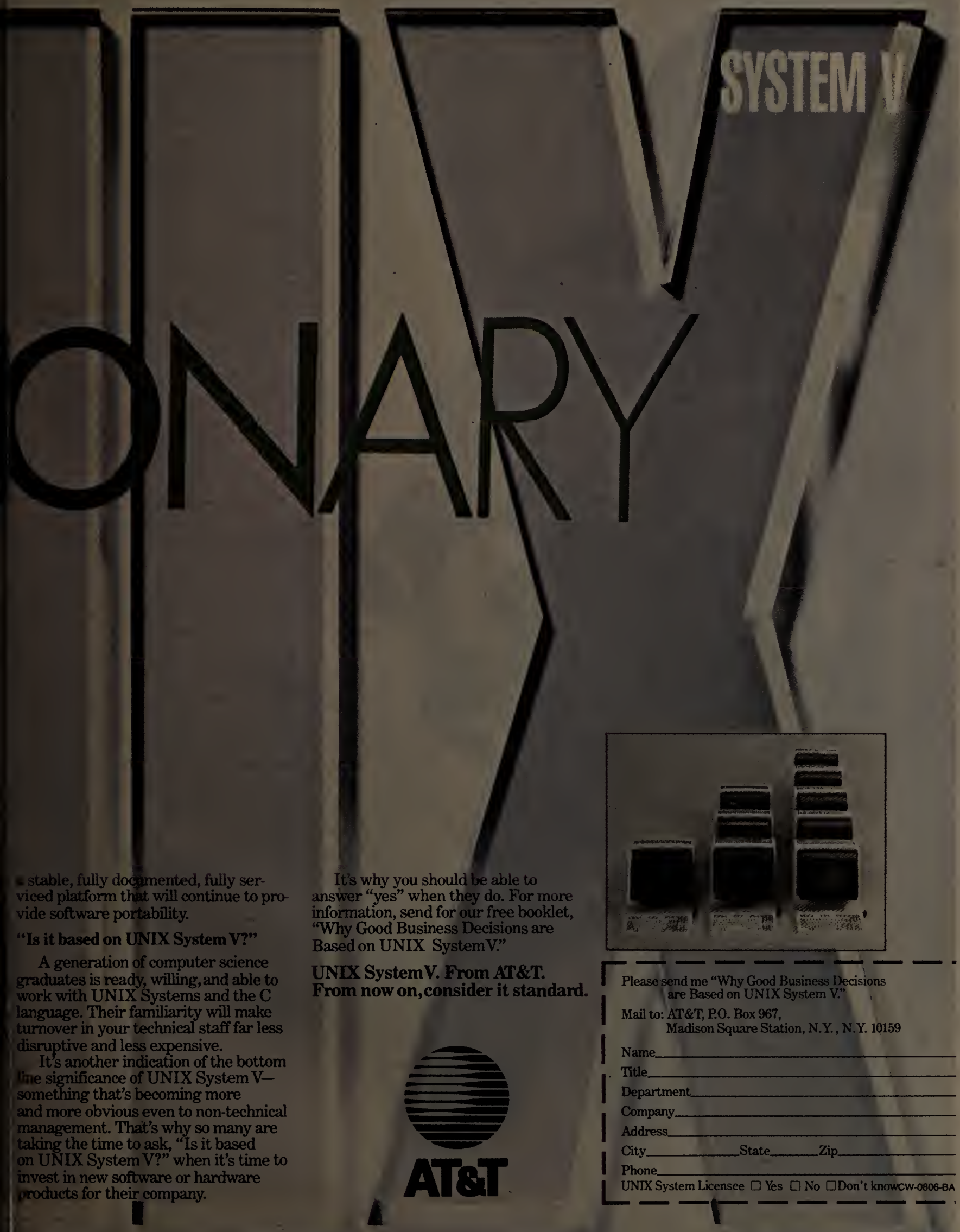
Ray said Mantech used some of the savings achieved through faster implementation to improve the quality and quantity of system documentation delivered to the customer.

As of mid-February, three additional subsystems, about the size of the first subsystem, had been implemented.

"Our policy is to use Mark V for all on-line application development," Ray said, "and if something can't be done easily in Mark V, we will probably restructure its design so that it can."

Mantech plans to install a CICS version of Mark V in the near future, thus providing the capability to use the same group of Mark V-trained programmers to develop both IMS/DB/DC applications and CICS applications.

"Then we won't need large numbers of IMS programmers for the IMS/DB/DC world and another large group of CICS programmers for the CICS world," Ray said.



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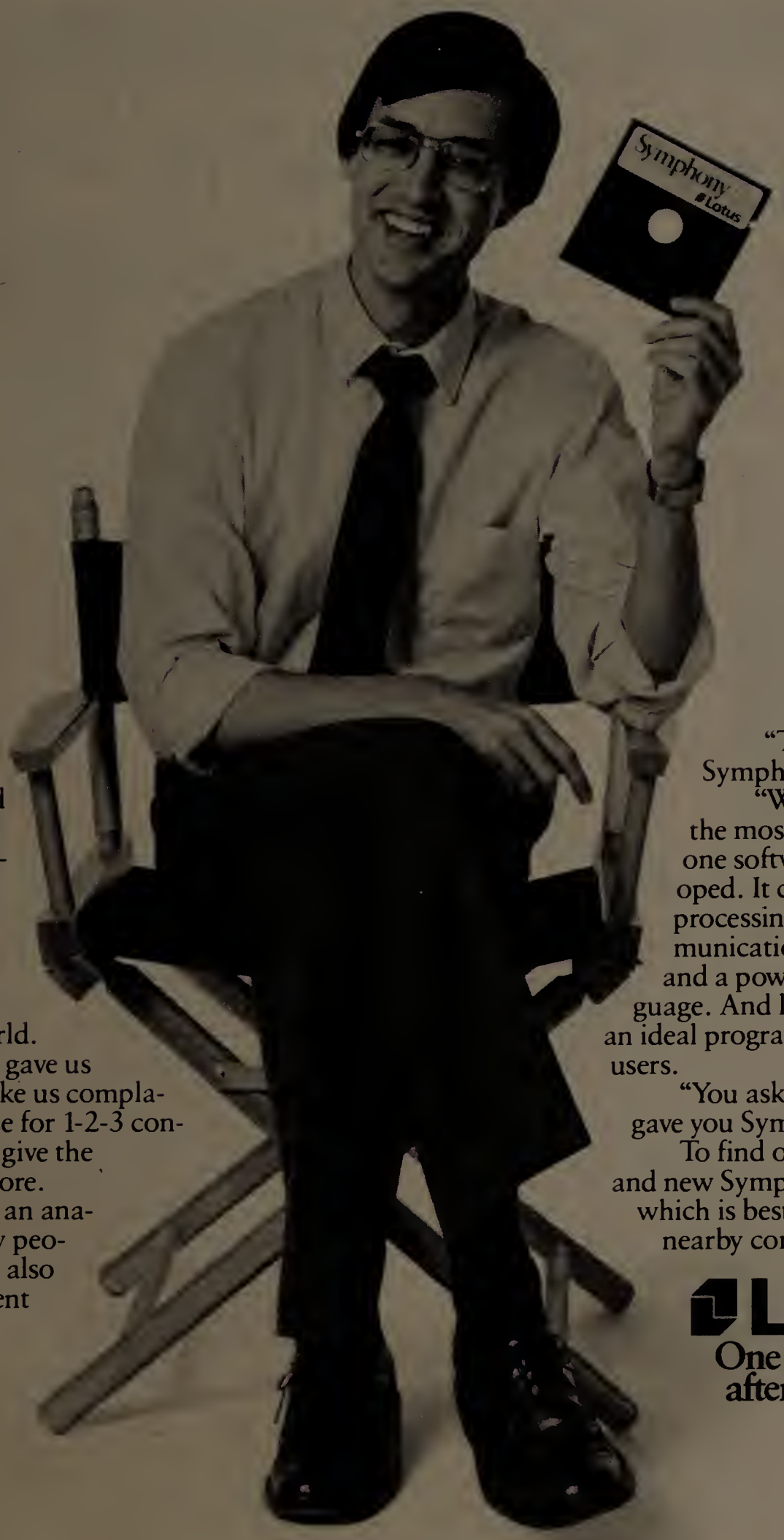

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CALENDAR

WEEK OF SEPT. 2

SEPTEMBER 4-7, NEW YORK — **TSO ISPF.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

SEPTEMBER 4-7, NEW YORK — **CICS Application Design.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held Sept. 10-13 in New York.

SEPTEMBER 5-7, WASHINGTON, D.C. — **Configuration Management of Software Programs.** Contact: George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

SEPTEMBER 5-7, SAN JOSE, CALIF. — **Office Automation and the Technology Revolution.** Contact: Data-Tech Institute, 386 Franklin Ave., Nutley, N.J. 07110. Also being held Sept. 12-14 in Columbus, Ohio.

SEPTEMBER 5-7, CHICAGO — **Structured Analysis for Users.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 5-7, NEW YORK — **Managing Projects in the Structured Environment.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 5-7, ALBUQUERQUE, N.M. — **New Gateways to SNA.** Contact: Data-Tech Institute, 386 Franklin Ave., Nutley, N.J. 07110.

SEPTEMBER 5-7, TORONTO — **Capacity Management Forum.** Contact: Institute for Information Management, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

SEPTEMBER 5-7, WASHINGTON, D.C. — **Artificial Intelligence.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 6-7, SAN FRANCISCO — **Systematic Software Testing.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 8-9, NEW YORK — **CICS Internal Architecture.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10036.

WEEK OF SEPT. 9

SEPTEMBER 10-11, BOSTON — **Fourth-Generation Data Management Software.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

SEPTEMBER 10-11, WASHINGTON, D.C. — **DBS IV.** Contact: Seminar Registration, Phillips Publishing, Inc., Suite 1200N, 7315 Wisconsin Ave., Bethesda, Md. 20814.

SEPTEMBER 10-11, HASBROUCK HEIGHTS, N.J. — **Supporting and Maintaining the Data Communications Network.** Contact: Data-Tech Institute, 386 Franklin Ave., Nutley, N.J. 07110.

SEPTEMBER 10-12, TORONTO — **The Second International Congress & Exhibition on Computer Security.** Contact: International Security Congress, 160 Duncan Mill Road, Don Mills, Ont., Canada M3B 1Z5.

SEPTEMBER 10-12, NEW YORK — **IMS Utilities.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

SEPTEMBER 10-14, MINNEAPOLIS — **Structured Programming Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 10-14, NEW YORK — **MVS JCL.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10036.

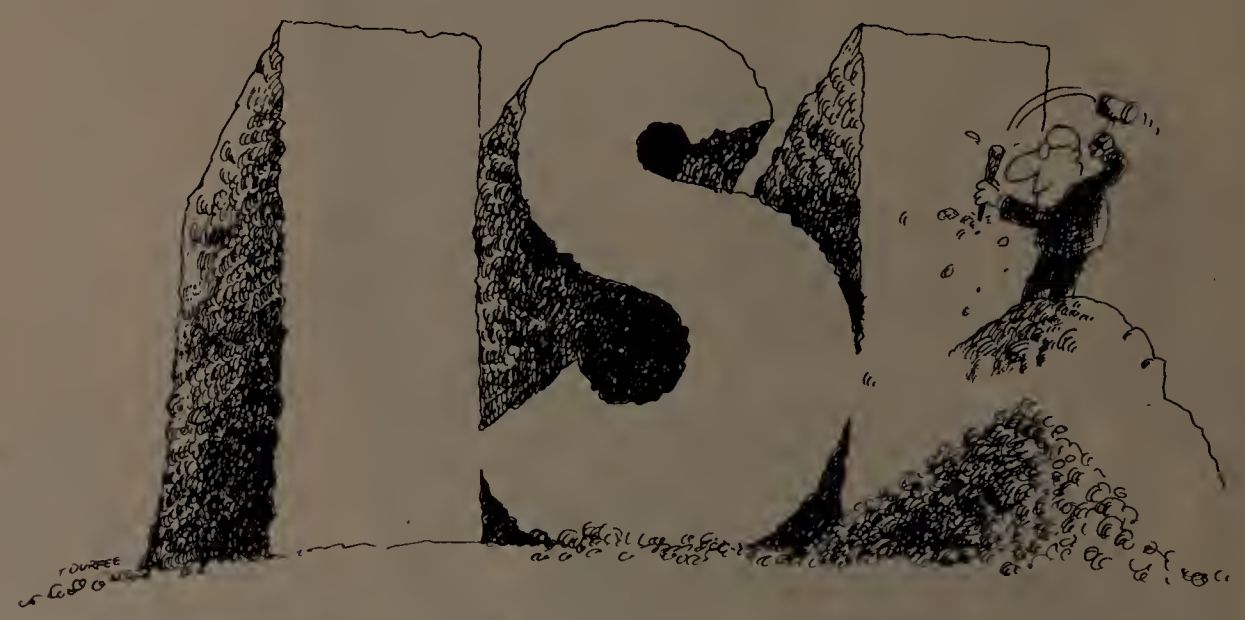
SEPTEMBER 10-14, PARIS — **The Sixth International Congress of Cybernetics and Systems of the World Organization of General Systems and Cybernetics.** Contact: Association Francaise pour la Cybernetique Economique et Technique, 156 Blvd. Pereire-F. 75017, Paris, France.

SEPTEMBER 10-14, BOSTON — **Structured Analysis and System Specification Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Sept. 10-14 in Houston.

SEPTEMBER 10-14, WASHINGTON, D.C. — **Operating Systems for Microcomputers.** Contact: George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

SEPTEMBER 10-14, ANAHEIM, CALIF. — **Structured Design for Real-Time**

THE HARD FACTS ABOUT PAYROLL/PERSONNEL SOFTWARE.



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Systems. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 10-14, NEW YORK — **Data Base Development Workshop.** Contact: Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

SEPTEMBER 10-14, PHOENIX — **Project Planning and Control Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 10-14, HOUSTON — **MVS/SP & XA.** Contact: Computer Systems Research, Inc., 40 Darling Drive, Avon, Conn. 06001.

SEPTEMBER 10-14, CLEVELAND — **Structured Analysis and Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 10-14, ATLANTA — **Structured Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

SEPTEMBER 11-12, DALLAS — **Integrating the Mainframe and the Micro in the Corporate Environment.** Contact: Institute for Advanced Computing Technology, Suite 108, 1433 Santa Monica Blvd., Santa Monica, Calif. 90404.

SEPTEMBER 11-13, DALLAS — **Midcon/84 High-Technology Electronics Exhibition and Convention.** Contact: Electronic Conventions, Inc., 8110 Airport Blvd., Los Angeles, Calif. 90045.

SEPTEMBER 11-13, DALLAS — **Data Base Administration and Data Resource Development.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

SEPTEMBER 11-13, BOSTON — **Electronic Imaging 1984.** Contact: Electronic Imaging 1984, Morgan-Grampian Expositions Group, Two Park Ave., New York, N.Y. 10016.

SEPTEMBER 11-13, ARLINGTON, VA. — **Voice Input/Output Systems Applications Conference 1984.** Contact: Association of Voice Input/Output Systems, P.O. Box 60904, Palo Alto, Calif. 94306.

SEPTEMBER 11-13, DALLAS — **Mini/Micro Midwest-84 Computer Conference and Exhibition.** Contact: Electronic Conventions, Inc., 8110 Airport Blvd., Los Angeles, Calif. 90045.

SEPTEMBER 11-14, LOS ANGELES — **Unix Systems Expo/84.** Contact: Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

SEPTEMBER 11-14, WASHINGTON, D.C. — **Distributed Processing: Mini and Microcomputer Implementations.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Sept. 25-28 in Boston.

SEPTEMBER 11-14, WASHINGTON, D.C. — **Data Communications.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Sept. 25-28 in San Diego.

SEPTEMBER 11-14, LOS ANGELES — **Designing Real-Time Systems: A Hands-On Workshop.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Sept. 25-28 in Washington, D.C.

SEPTEMBER 11-14, WASHINGTON, D.C. — **Designing with 16-Bit Micros.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. Also being held Sept. 18-21 in Los Angeles and Sept. 25-28 in Long Island, N.Y.

WEEK OF SEPT. 16

SEPTEMBER 18-19, WASHINGTON, D.C. — **Mortgage Banking Automation Workshop and Computer Expo.** Contact: Director of Registrations, Mortgage Bankers Association of America, 1125 15th St. N.W., Washington, D.C. 20005.

SEPTEMBER 18-21, SAN DIEGO — **Implementing Local-Area Networks.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45404, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Sept. 25-28 in Washington, D.C.

SEPTEMBER 19-20, UNIONDALE, N.Y. — **Dbase II.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Sept. 24-25 in Los Angeles and Washington, D.C.

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EDITORIAL

Refreshing news for DP crime bill

The federal government will not often be accused of acting hastily to address pressing problems with new legislation. For this reason, it was refreshing to note the decisive way the U.S. House of Representatives dispatched a major computer crime bill, approving the proposed legislation unanimously [CW, July 30] and sending a clear message both to the U.S. Senate, which will now mull over the bill, and to would-be perpetrators of computer crimes.

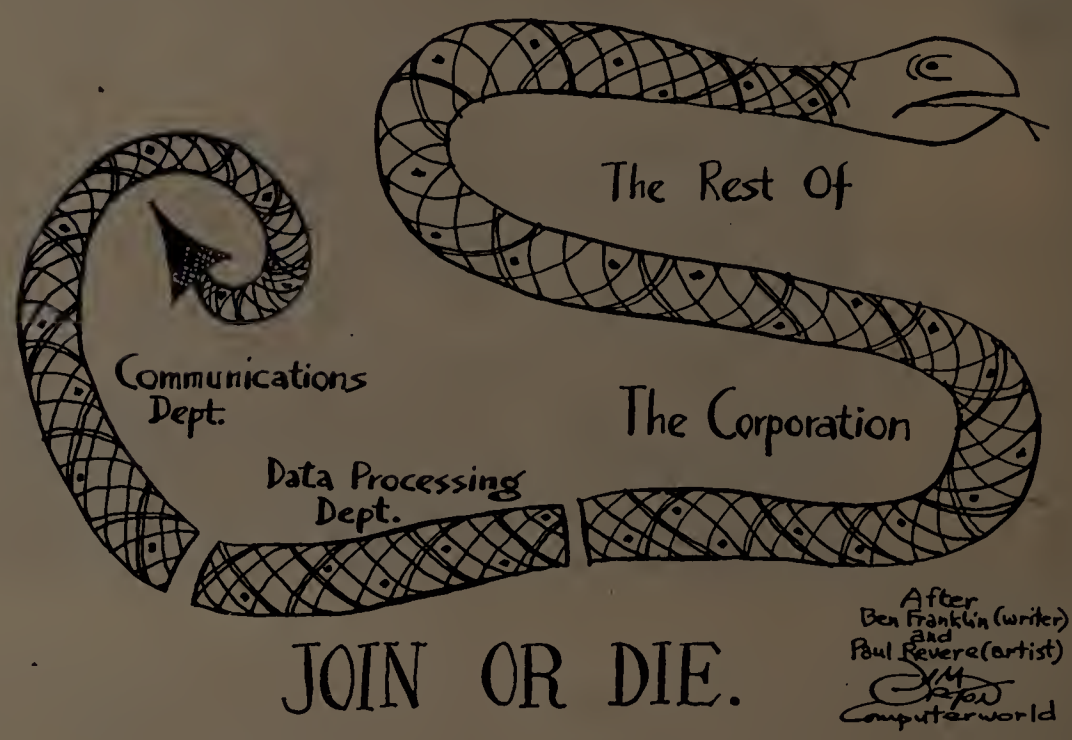
Forget about election-year politicking and interparty squabbling. This is an issue that is truly hot in what is otherwise a pretty dead capitol city this time of year. As the 393:0 vote showed, there is ample bipartisan support to put some teeth into the anti-computer-crime rhetoric that has grown louder with each new, illegal intrusion into private data bases.

The proposed bill is tough as well as far-reaching. Those convicted of accessing U.S. government files or files of companies doing business across state or international borders could be fined $10,000, or up to two times the amount of the illegal financial gains. Add a prison sentence of up to 10 years — 20 years for repeat offenders — onto the fines, and you've got a serious law. There are lesser penalties provided for lesser computer-assisted offenses, such as wrongful disclosure of computerized government data.

For those who would sidestep such a law and commit their computer-assisted crimes intrastate, there is the sobering reality that a growing number of states, more than half at last count, have written or are in the process of composing similarly tough computer crime laws. The number of "safe houses" for high-tech desperadoes is dwindling, and fast.

Still, as the authors of the federal bill pointed out, much work needs to be done within the computer community to educate the users, particularly the small system users, about the intricacies of data security. To date, the criminals have been one or more steps ahead of de facto data security measures (how safe is the system that can be accessed by high schoolers using micros and common phone lines?).

But there are many positive signs that the crime issue is finally being addressed effectively on several fronts. And that's good news.



LETTERS

Users need IBM source code

Milt Bryce defended [CW, June 4] IBM's expanding object-code-only policy, previously attacked by a variety of users [CW, May 14]. I believe he is too optimistic. I'm not content to offer critical computer services to my employer based on the assumption that "this [sourceless product] policy will encourage IBM to be more knowledgeable . . ." and to "hope [IBM] can back it up with quality software."

The need for source code is not based on the desire to "be fire fighters, much to the economic disadvantage of . . . organizations." Rather, it comes from the need to provide function, support, reliability and availability beyond what IBM supplies.

Customers have a valid need to enhance IBM software. IBM could protect its assets in ways that would not impair customers' ability to use its products effectively.

Gabriel Goldberg
McLean, Va.

Setting the record straight

The interview with Mr. John Akers, president of IBM [CW, July 2], contains a question regarding the European Economic Community action against IBM. In answering the question, Akers mistakenly stated that Amdahl Corp. "lost in the courts in the U.S."

Amdahl has never been a party to litigation regarding IBM in the U.S. courts.

Richard A. Whitcomb
Amdahl, Sunnyvale, Calif.

__Computerworld__ welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for the purposes of clarity and brevity.

Letters should be addressed to __Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.__

DATA PAST

Five years ago

WASHINGTON, D.C. — Two years after the U.S. Privacy Protection Study Commission's work, many firms had not adopted privacy safeguards for employee records, many of which were computerized.

WASHINGTON, D.C. — The Federal Communications Commission ruled that it must regulate the U.S. Postal Service's Electronic Computer-Originated Mail service.

Ten years ago

WASHINGTON, D.C. — A government productivity study found that an average productivity increase among agencies studied was tied directly to computerization.

SAN FRANCISCO — Southern Pacific Communications Co. applied to the Federal Communications Commission for approval of the first coast-to-coast digital data transmission service, said to be similar to AT&T's proposed Dataphone Digital Service, yet with 15% higher digital data rates.

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VIEWPOINT

The need for communication by the DBMS staff

THE DATA CENTER
John P. Murray

This is the seventh in an eight-part series.

Because of the emotional stress produced within the typical management information systems department when the commitment to a successful data base management system (DBMS) environment is made, those within the MIS department must be kept informed of the plan for the DBMS, changes to the basic plan and the progress of the plan as time moves on.

It would seem reasonable to speculate that the commitment to move to a true data base environment, with all the state-of-the-art and technical benefits such a commitment entails, would be greeted with considerable enthusiasm within the MIS department. While such is often the case at the onset, that enthusiasm will wane as the effort moves ahead.

Given the inherent benefits to members of the MIS staff in developing a DBMS environment, the effort should offer members of MIS much of what they profess they are seeking — items such as new technical challenges, growth opportunities and the chance to become more involved in aspects of the business outside the MIS department. If that is the case, doesn't it follow that the development of a DBMS environment offers much of what MIS employees profess to be seeking, and shouldn't such an approach be expected to find strong MIS support? The answer is yes.

However, the introduction of the DBMS represents a considerable change in the way the work of the MIS department will be carried out. Specific duties will change, responsibilities and jobs will change and, perhaps most importantly, in certain circumstances, authority will be reduced if not taken away.

Beware of rumors

In addition to those changes and the unrest they will create within the various sections of the MIS department (which can be disconcerting enough by itself), the situation will be further exacerbated in a climate where much of the information about the use and direction of the DBMS and its impact upon the individuals within MIS is generated as a result of rumor and speculation, rather than fact.

No matter how it is handled, the movement to a data base management system is a traumatic experience for a number of areas of the organization, particularly MIS. It is critical that, insofar as is practical, members of MIS be kept informed of the planning behind the DBMS effort and the progress being made with the effort.

In addition to the myriad technical, operational and political problems that have to be faced with the DBMS, the morale problems of the MIS staff must also be considered. While it is true that, from a management perspective, such an effort can be an exercise in tedium, it is most important that the MIS staff be informed.

In addition to keeping everyone abreast of what is going on within the DBMS effort, it is also important that management solicit and fairly consider comments and suggestions about the environment that is being built. In addition, if MIS management can handle the process, there should be an effort to solicit criticism and to respond to those criticisms.

It can be stated with a reasonable amount of assurance that, no matter what the ultimate decisions, there will be some amount of discontent with the ultimate plan. You cannot please everyone, and you should not try to. However, everyone deserves to know what is being done in areas that affect not only their current jobs, but also their careers.

It is a fact that many times, people in the MIS development areas simply are not willing to change with the times. If these people will not accept the changing environment, and cannot become comfortable with the DBMS environment, then everyone really is better off if they go their own way. If the goals of the DBMS plan are of value to the organization, then MIS management has a responsibility to see that effort through to its conclusion. If members of the MIS staff are not willing to join in the effort, that must not become a reason for delay.

The introduction of the DBMS and the movement to a DBMS environment does indeed create any number of cultural changes within the MIS department. Doing this and pushing it to produce the desired results in a reasonable amount of time is a high-risk situation for MIS management. Being forced to deal with recalcitrant members of the MIS staff as an adjunct to that effort certainly increases tension within MIS. The salient consideration, however, must be the attainment of that which is best for the entire organization. Clearly, given the benefits of a strong DBMS, the effort must be aggressively pursued.

Members of MIS management should keep in mind the fact that, no matter what they do, they will be open to criticism. It is simply better, in the final analysis, to act in the best interests of the organization. If that causes tension, difficulty or unrest, so be it. The course that will, in the end, be of the most benefit for the entire organization must be followed.

Next: The pitfalls of overselling the DBMS concept.

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Can portables pass the confiscation test?

HUMAN CONNECTION
Jack Stone

I don't mind a few ads here and there describing some new and novel machinery, but I do object to being bludgeoned, in a manner of speaking, by the Madison Avenue advertising boys who apparently have little else to do but promote portable computers.

One can hardly turn the pages of even the dreariest of computer-related magazines without seeing yet another happy, smiling junior executive who is comfortably ensconced in a well-upholstered seat in a well-appointed, first-class cabin aboard an airliner seemingly bound for Hong Kong — all the while gaily tapping away on his battery-operated machine, presumably plotting the success of his corporate empire for the next decade. Too much!

Though admittedly enamored of the concept of a lap computer — but still waiting for one to meet my particular needs and budget — I find that the excessive publicity has been counterproductive; it has shaken my confidence that using one outside of the office, in cars, trains and planes, for example, is all that practical. So a few months ago, I launched my own field test program to establish, in an objective and scientific way, proof as to precisely where and how the laps are operable and useful and what their limitations are.

First, with regard to testing parameters, the machine was, of course, to be subjected to the broadest range of physical conditions. However, in fairness to the manufacturers, the environment had to be one conducive to productive human endeavors. It was this latter factor that forced me to reject the notion of using a Lexington Avenue subway train (in high-tech New York City) because the conditions therein are clearly inhumane. Then I picked up the idea of setting up some financial planning models while exercising on a trampoline, but then dropped it when I computed it would take me 3.784 months to get in shape to do it. I even thought about asking the crew of the *Discovery* to haul one along on their next mission as a backup to their on-board systems, but they obviously have their hands full with the propulsion subsystem.

The right spot

Then, eureka! Reveling in victory as surely did Einstein in his relativity research, I saw the Yucatan jungle as just the right spot. I was already planning another journey to Mexico, and I felt that I could check out the machine there and do some writing on it at the same time. Furthermore, not only are temperature and humidity conditions perfect for computer evaluation, but I could also study its performance when under attack by tsetse flies. Besides, this program would give me yet another opportunity to figure out how to cross the border with a computer without finding myself accused of smuggling and forced to spend my summer in a torrid slammer.

The next step was finding just the right machine, one that was full-functioned, operationally proven and light as a feather. I contacted Teleram Communications Corp. in White Plains, N.Y., which, recognizing the significance of my endeavor, agreed to provide one of their 3100 systems to me on loan. It was certain that this unit and its portable disk drive (about 16 pounds total) would meet any environmental challenge and any inadequacy on the part of the operator (a polite way of saying that the machine will work in spite of my general incompetence).

The system arrived a few days before my departure, and it was just fantastic. I didn't have much of a chance to check out its operations, but its keys' tops were enchanting: Caribbean blue was a dominate theme of the topmost row, a perfect complement to the mahogany red in the upper right corner. The kicker was the carrying case, a black-and-white herringbone tweed, surely an Yves St. Laurent creation. It was easy for me to imagine a writing session on this cutie, while curled up on some palm-treed, remote beach, taking care not to spill my margarita over the keyboard.

The night before my writing partner and I were ready to fly to Cancun, a friend from the Mexican tourist office in Washington, D.C., stopped by for a farewell libation. When I proudly showed him my new portable, he reeled, saying that it would surely be seized on the spot by customs agents who would be completely taken with its design. Further, there were check points at each of the dozen or so airports we were planning to visit on our cross-country tour; as a consequence, the chances of the 3100 ever seeing the U.S. again were practically nil.

Tears welled up in my eyes as my fantasies evaporated into thin, acrid smoke. The brutal fact was that I had not measured properly the machine's confiscation factor, an important consideration in shipping systems into taco country.

To be continued. ‡

Stone is an independent management consultant, educator and writer, specializing in DP human communications and personnel development, based in Washington, D.C.

VIEWPOINT

DP crime bills: One person's trivia is another's living

READER'S PLATFORM
D. G Ingraham

Edward C. Saltzberg criticized the Massachusetts Computer Crime law proposal in his Reader's Platform [CW, July 9]. We have actually had such a law here in California for over four years, and our legislature is now amending it to address the so-called "electronic browser, alias hacker" problem.

Saltzberg asserted that the definition of data base is so broad as to justify the arrest of someone for reading a newspaper. This is the familiar "criminalizing trivia" argument, and it is as misleading as it is hackneyed. Any attorney or other reader could browse through a law book and dream up scenarios of repression and overreaching, which is why we have elected prosecutors and legislators and courts. One person's trivia is another's living. It is worth wondering why Saltzberg's essentially legal arguments are not addressed to a primarily legal readership. Perhaps it is because no lawyer would take seriously for a moment the notion that such abuse would be condoned by the courts or by anyone else.

The possibility of the persecution of newsstand browsers surely exists in Massachusetts now and presupposes the complete lack of control and balance by law enforcement, a hypothesis that is logically self-created and practically undemonstrated. If information is property, then it can be protected.

Grim specter

Another grim specter hails from the same eldritch abyss — that language prohibiting access "without authorization" somehow places all people under the threat of immediate arrest, prosecution and incarceration unless for any particular access they can produce written, and maybe even notarized, specific authority. Come off it.

The phrase "without authorization" has long been established in law: It requires that the party complaining of an intrusion or trespass demonstrate, by evidence beyond reasonable doubt, not only that the defendant's act was not authorized, but also that no reasonable person would have thought that it was. The burden of proof is on the complainant in Massachusetts, as well as in California and all the other states that have protected computerized information with a criminal sanction.

Even more puzzling is Saltzberg's obscure suggestion that the provision in the Massachusetts proposal that does not preclude the application of other statutes somehow raises "serious double jeopardy problems."

No dark purpose

Let me assure your readers that the California computer crime bill has the identical language, as do California statutes on other crimes, as do the laws of other states. There is no dark purpose here — only the iteration of a standard legislative phrase. Even in California, where we boast of defense lawyers and defense-sympathetic courts that are the equal of civil libertarians anywhere, I have never heard such standard terms called ambiguous, nor such a routine clause painted with such paranoid pigments. At least this point of the criticism was original.

Finally, the critique decries the notion that Massachusetts judges could be empowered to order restitution and to award damages. I cannot believe that the national awareness of the rights and needs of victims has somehow passed over the Commonwealth of Massachusetts. Requiring the criminal to restore the victim, to make good on his crime, is not new or noxious to a civilized society. Of course, it requires judges to exercise judgement; that is, after all, why we have them. And Saltzberg is surely aware that the subject of restitution and damages is very much the subject of discussion and judicial review. It is nothing new — not to Massachusetts, not to computer crime laws.

No person denies that the development of electronic data processing has created vulnerabilities in personal property and privacy. Surely by now, any speculative misgivings about the propriety of addressing particular criminal statutes to computer abuse should have given way to experience and the "debugging" of years of actual court application throughout several states. While my knowledge is mainly from the California experience, I have seen nothing to disprove it and much to support it.

As an outsider, but one familiar with the problem, let me suggest to my legal brethren in Massachusetts that the time for you to get a computer crime law is now late. The need for informed discussion is there already. But the benefit to such a discussion of scare tactics and whimsical forebodings is, and will always be, nonexistent. ‡

Ingraham is an assistant district attorney in Alameda County, Calif., and the secretary of the International Association of Computer Crime Investigators, a nonprofit California corporation.

SOFTWARE & SERVICES

System generator debuts for IBM mainframes

By John Gallant
CW Staff

CLEVELAND — Leading Software Technologies Corp. has announced an application generator for IBM mainframes that is said to generate complete software systems as well as specific programs.

Called the Intelligent Assistant, the software is said to require the designer to define only the inputs and outputs of a system. Once they are defined, the Intelligent Assistant automatically designs the master files, determines programs and program logic, prepares structured Ansi Cobol code and specific JCL, provides documentation and delivers a working version of the application for approval. The system is said to be able to generate up to about 40,000 lines of Cobol code per CPU second.

Designed for data processing professionals rather than end users, the Intelligent Assistant requires a programmer/analyst to define a business problem in a few statements. It then produces a detailed design of the applications system, designs the system master files, determines the number of programs needed, designs the logic of each program, designs the work files to pass data between programs, programs the designed system in structured Ansi Cobol, produces JCL needed to run the system and documents the entire system, a spokesman said.

Documentation includes table of contents, systems description, flowcharts, I/O specifications, program and system narratives, product control reports, on-line control updates, JCL, librarian guides and data entry guides. The product includes a built-in data dictionary that describes where every I/O element can be found and what is done with it.

If a user wants to make modifications to a program, the system can be quickly regenerated with the new information, the spokesman claimed. The Intelligent Assistant is said to be compatible with all IBM mainframes and is described as a system-level generator that may also be used as a program generator. It is reportedly equipped with its own logic and user language.

It reportedly simplifies system conver-

See **LEAD** page 49

DG announces Common Lisp environment

WESTBORO, Mass. — Data General Corp. has announced a programming environment built around Common Lisp, the dominant language for artificial intelligence systems. The environment is for use on the company's 32-bit Eclipse MV family of superminicomputers and the Distributed Systems DS family of engineering workstations.

The environment includes an interactive interpreter; an optimizing compiler that allows programmers to set priorities for specified performance criteria; CCA Uniworks, Inc.'s CCA/Emacs, a self-documenting, customizable display editor; and facilities for calling procedures written in Ada, C, Cobol, Fortran 77 and PL/1.

Other features include a facility that restructures lengthy programs into an easier-to-read format; automatic heap management, which maintains data created in independent programming sessions; garbage collection, a utility that automatically clears the system memory of unneeded data; the ability to mix compiled and interpreted code; and all standard Common

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What *is* a fourth-generation language?

SOFTLINE
Eberhard Rudolph

Today there are numerous different dialects claiming the label "fourth-generation language." In the absence of a commonly accepted definition, there is much confusion over just what qualifies as such. Successful fourth-generation languages share three characteristics:

- They provide application programmers with productivity improvements that are at least one order of magnitude higher than third-generation languages.
- They can be easily learned and remembered.
- They can be understood and used by both the DP specialist and the end user.

Rudolph is a senior lecturer in the Department of Management Studies of the University of Auckland, New Zealand. He is currently on sabbatical leave with Burroughs Corp.

In order to achieve these characteristics, fourth-generation languages use an application-oriented syntax that is quite often, but not necessarily, nonprocedural. Furthermore, they remove most or all of the repetitive detail work and integrate the various subsystems necessary in third-generation languages such as Cobol (see Figure 1 page 44).

Sound fourth-generation languages are based on the subcomponents of existing software environments. Such key components may include a data base management system, a data dictionary, a query and reporting facility, screen formatting and data communications. Most of these facilities exist in third-generation software environments. Each has been proven in the field and is often integrated with the hardware development of the computer manufacturer. Frequently a manufacturer will label the collection of these compatible, but distinct software components "standard software."

People who implement fourth-generation languages face the temptation to rewrite and replace existing software subcomponents in order to facilitate inte-

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- Genesys Software Systems, Inc. has entered the human resource software market, unveiling a large package for IBM mainframes/**46**
- Data Design Associates is offering new software to monitor the progress of large-scale construction projects/**46**
- Pathway Design, Inc. has announced products that connect Unix-based microcomputers to a variety of large-scale systems/**47**
- The new release of Trax Softworks, Inc.'s ESS mainframe spreadsheet includes improved facilities for uploading microcomputer spreadsheets/**45**
- Data General Corp. users have a new facility for converting MAI/Basic Four Corp. software to run on their systems/**45**

INSIDE

Systems Software/**47**

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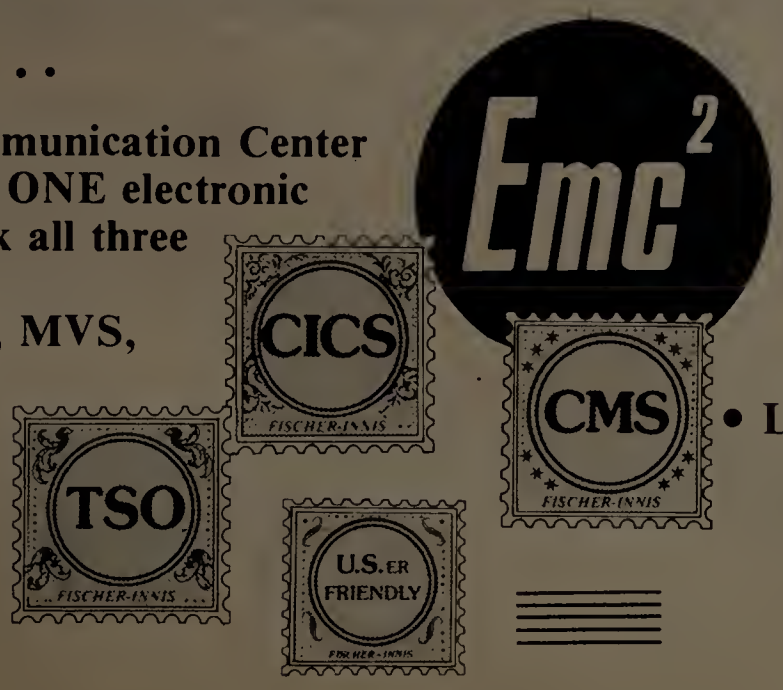

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gration into their fourth-generation language. Alternatively, they can base their fourth-generation language on the standard software of their hardware environment.

Basing the fourth-generation language on standard software will greatly reduce migration problems when moving from other technologies. At present, almost all popular fourth-generation languages use special-purpose software components or third-party software. Application programs written in fourth-generation languages that are not based on standard software components tend to address small or stand-alone systems. Current research, however, indicates that fourth-generation languages best address large applications.

IBM's Function Point Technique is ideally suited to demonstrate the payoff of fourth-generation languages. Using this measure, each application program can be assigned a numeric value describing the information functions the application program delivers to the end user. The effort (measured in time) required to generate function points using fourth-generation languages can be compared with the results obtained from applications based on third-generation languages.

Rather than DP experience, fourth-generation languages require that users have application knowledge and experience in order to be effective. The traditional software development cycle — which is based on third-generation languages — has to be revised. End users will actively participate during the whole development period, and the detailed design and specification stage will be replaced by prototyping.

Many DP professionals regard these changes as a threat to their occupation, particularly since some fourth-generation language vendors market their products as programmerless software development tools. In reality, however, the opposite is true. Rather than devaluing the expertise of a DP professional, fourth-generation languages enrich the competent expert. Trivial, repetitive work is automated, and the expert can focus on the demanding areas.

The greatest resistance to fourth-generation languages appears to come from existing installations with a large base of third-generation software. The common justification for not using the new languages is the huge software investment of the past. This argument is not very convincing in light of the order of magnitude productivity gains.

If fourth-generation languages really allow 20 times faster application development, then all old software can be converted in 1/20 of the original time. This is well within the budgeted time for the most pressing application backlog.

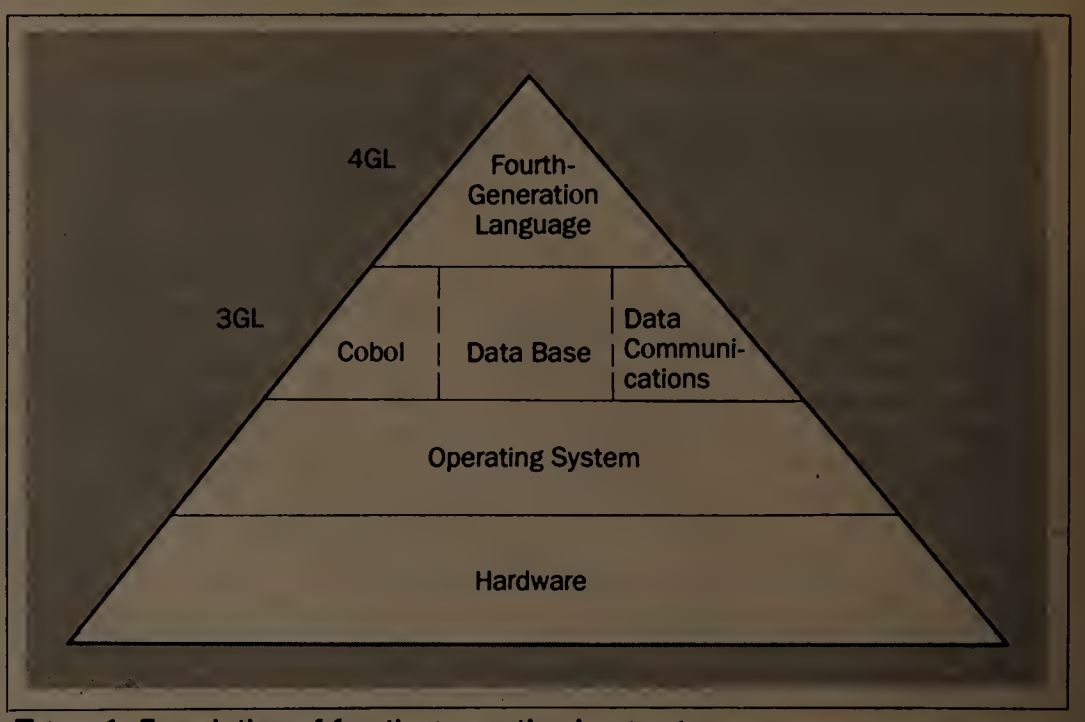


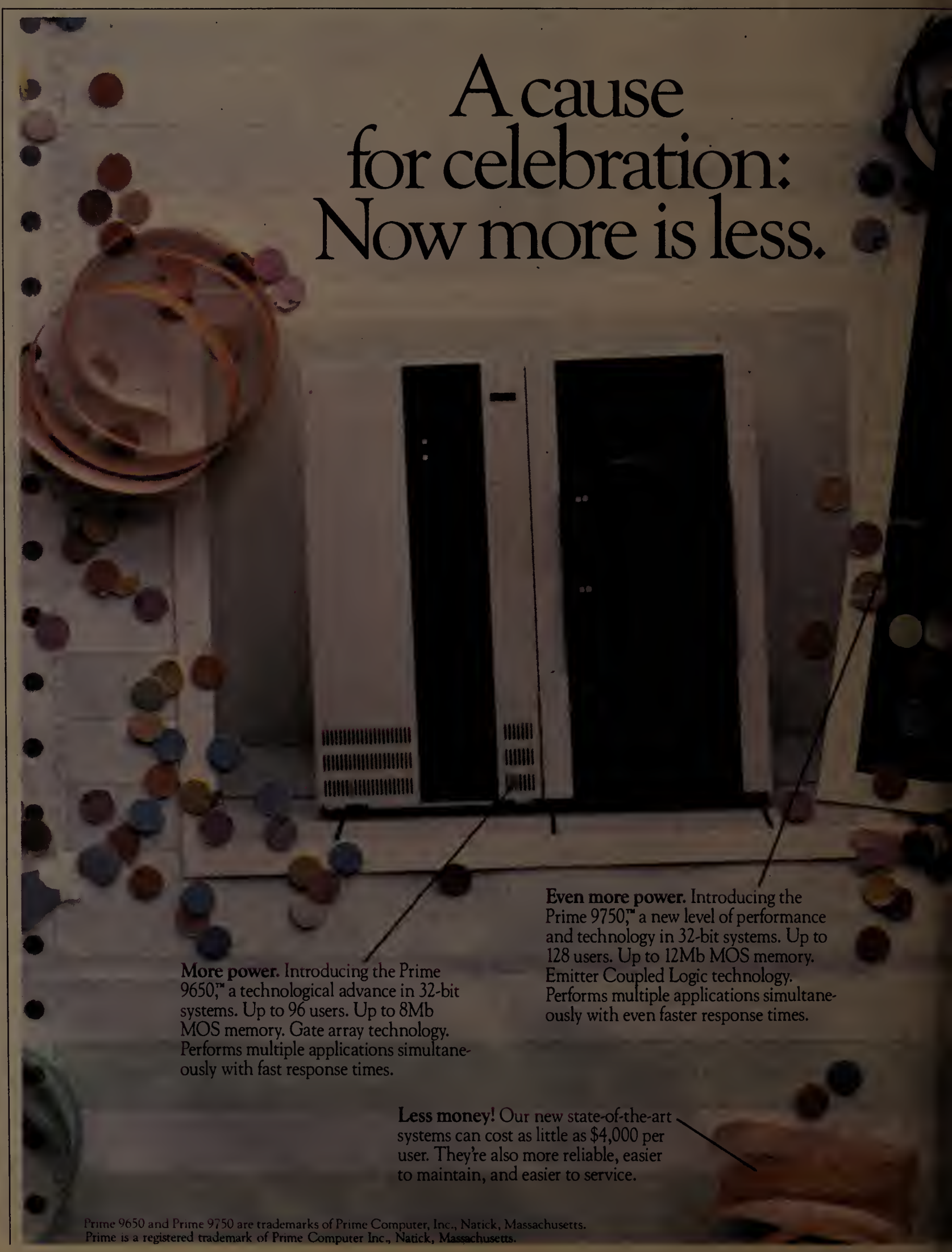
Figure 1. Foundation of fourth-generation languages

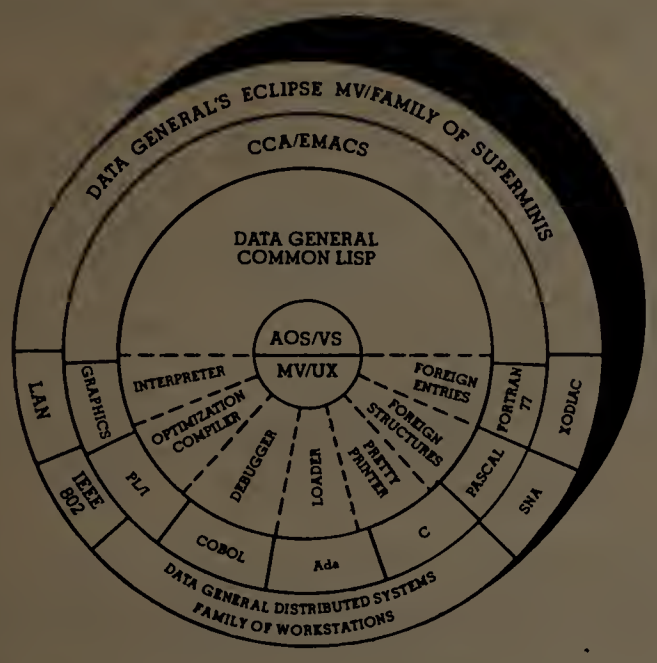
Evaluating languages

When evaluating a fourth-generation language, the following areas should be considered:

- The language should address the major information requirements of the organization.
- It should be understood by end users and DP professionals.
- It should use the standard software of the hardware in use (particularly the DBMS).
- It should not obstruct a growth path to more powerful computing resources in order to allow for increased requirements in the future.
- Evidence should exist of an order of magnitude productivity gain in a similar environment and application area.

The active participation of the end user is a must, for both pilot projects and full implementations. Equally important are small team sizes and departures from bureaucratic, third-generation software development cycles.





DG from page 43

Lisp debugging aids.

The programming environment is fully portable across the entire DG 32-bit computer line without recompiling or relinking, a spokesman said. This allows programs to be developed on one machine and ported to any another.

The Lisp programming environment can be used under DG's AOS/VS and MV/UX (Unix) operating systems. It can also be used with DG graphics products and system communications capabilities.

Initial licenses on the Eclipse MV family cost $8,000. On the DS family, license prices are $2,000. Shipments begin Jan. 1.

Information is available from DG, which is located at 4400 Computer Drive, Westboro, Mass. 01580.

'ESS' offered for VM/CMS, MVS/TSO shops

LOS ANGELES — Trax Softworks, Inc. has announced Release 2.1 of its Electronic Spread Sheet (ESS) for IBM VM/CMS and MVS/TSO environments.

According to a spokesman, the enhanced release of ESS offers easier loading of microcomputer-originated spreadsheets, new macro capabilities and added functions. Release 2.1 is said to support Lotus Development Corp.'s 1-2-3 and Software Arts, Inc.'s Data Interchange Format files as well as Visicorp's Visi Calc files, allowing the mainframe to load and save micro spreadsheets. The macro capabilities are provided by an interface to the Exec and Clist facilities of VM/CMS and MVS/TSO.

The spokesman said frequently used commands can now be stacked and executed with one command, and users can utilize the macro capabilities to create ESS applications in which the spreadsheet becomes transparent to the user.

In addition, financial, calendar and statistical functions have been added.

Release 2.1 also features an enhanced external file interface to allow for the loading and saving of data files for most applications running on the mainframe.

ESS is leased on a monthly ($220), one-year ($2,400), two-year ($4,400) or three-year ($6,000) basis from Trax Softworks, 10801 National Blvd., Los Angeles, Calif. 90064.

Business Basic emulator bows

WESTBORO, Mass. — Data General Corp. has announced a software emulator for MAI/Basic Four Corp.'s implementation of the Business Basic programming language.

According to a spokeswoman, DG's SMbasic emulator gives users the ability to convert Basic Four applications to DG systems. SMbasic operates on the full line of DG systems under the firm's AOS, AOS/VS and AOS/WS operating systems.

SMbasic is said to provide a set of menu-driven utility programs that aid in the conversion of programs and data files, which can be moved to DG systems on tape or diskette or by transmitting them from MAI/Basic Four hardware to DG hardware. Additional utilities are provided to create and list program libraries, list DG Infos II file directories and reset file-in-use counters.

The spokeswoman said both SMbasic and DG's Comprehensive Electronic Office (CEO) system use Infos II for file management, allowing SMbasic users to use the CEO system for office automation.

SMbasic is scheduled for delivery in the fourth quarter. For an initial license, the price is $7,000 for AOS/VS, $5,400 for AOS and $900 for AOS/WS. Data General is located at 4400 Computer Drive, Westboro, Mass. 01580.

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Human resource management system debuts for IBM mainframes

LAWRENCE, Mass. — Genesys Software Systems, Inc. has announced an integrated human resource management system (HRMS) for IBM mainframes in the IBM OS and DOS environments.

According to a spokesman, the HRMS — dubbed Genesys — operates in conjunction with IBM's IMS data base management system and includes Genesys Software Systems' All-Screen utility software for customization of the package.

It also includes benefits, personnel and payroll accounting modules.

Each application is accessible on-line, and users can expand the integrated employee record files for benefits, personnel and payroll to reduce data redundancy and errors due to duplicate entries, according to a spokesman.

The system's Benefits Management, Personnel Administration and Payroll Accounting modules may be purchased separately for later integration.

The Personnel Administration module is said to offer a master file design with a two-tier data base structure for individual and group records, and it features unlimited record keeping capabilities for compliance with changing government regulation and reporting and for in-house services.

The system's Payroll Accounting module features exception-oriented processing and addresses the payroll requirements of large, multi-divisional organizations, the spokesman said.

The complete Genesys HRMS package is priced at $300,000, and individual modules range in price from $50,000 to $110,000.

Genesys Software Systems is at 20 Ballard Way, Lawrence, Mass. 01843.

Progress monitor introduced

SUNNYVALE, Calif. — Data Design Associates has announced the Capital Project Management System (CPMS) for use with a variety of large systems.

According to a spokesman, CPMS will monitor the progress of construction projects and other large expenditure programs to ensure that allocated funds are being properly spent within a budgeted framework.

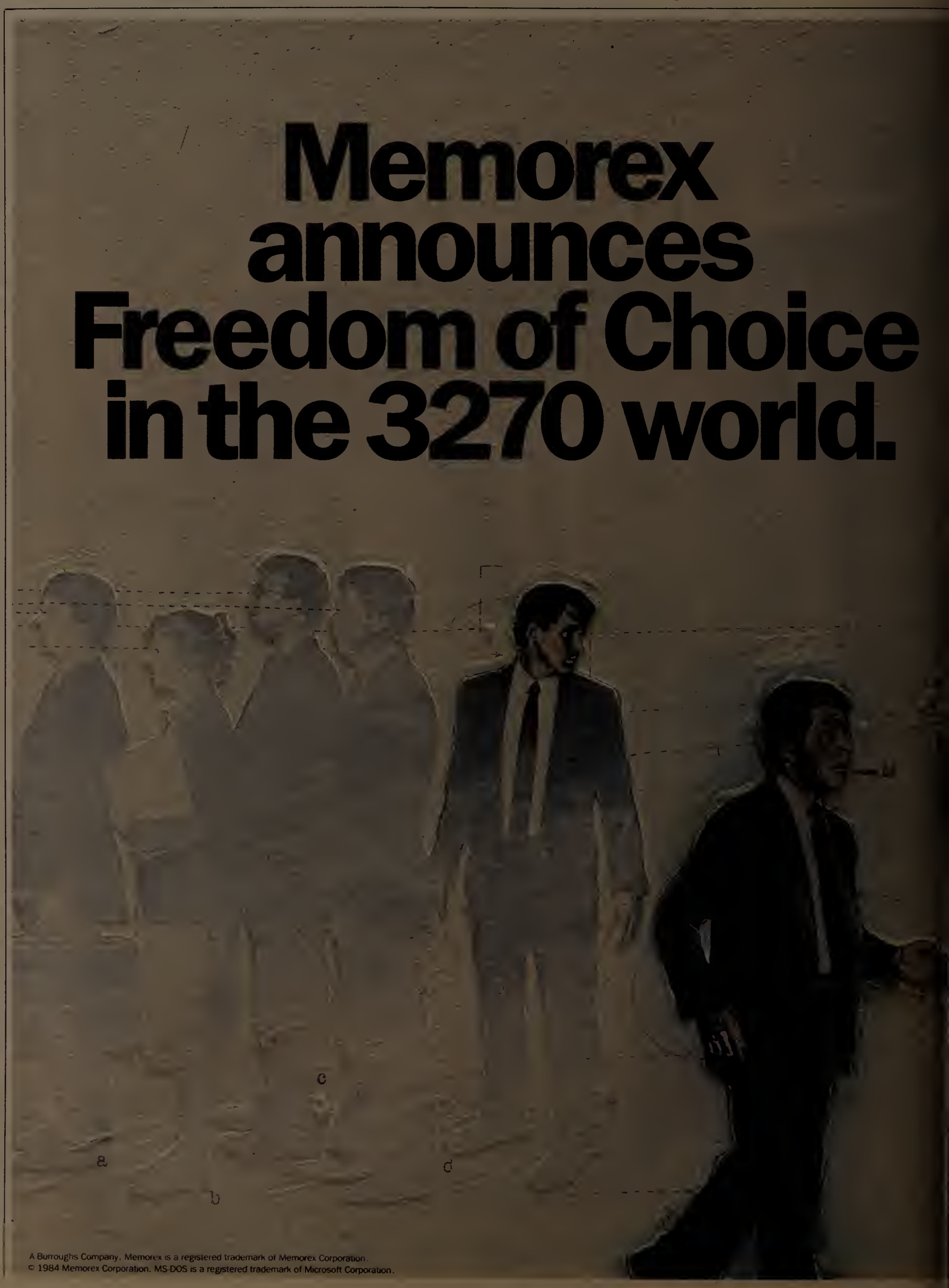
It will function in an on-line, real-time mode on IBM 4300 and 30 series and larger processors and on Hewlett-Packard Co.'s HP 3000 line. It will also work in batch mode on large-scale processors from Burroughs Corp., Honeywell, Inc., Digital Equipment Corp., Data General Corp. and Sperry Corp.

The spokesman said that when a project or project phase is completed, CPMS automatically translates expenditure data into a fixed asset, in accordance with specific user instructions. The system features Data Design's Advanced Systems Architecture so that CPMS can integrate with the company's other financial systems. Included is a series of standard reports that can inform users of the amount each project phase is over or under budget.

The system can perform trial translations of expenditure data to fixed assets, enabling users to experiment with different cost combinations in establishing fixed asset values for depreciation purposes, according to the spokesman.

It can take a single expenditure, parts of an expenditure or groups of expenditures and combine them to make one asset, and it can allocate parts of expenditures to different components of a project.

CPMS is scheduled for shipment this fall. Prices begin at $15,000 from Data Design Associates, 1279 Oakmead Pkwy., Sunnyvale, Calif. 94086.



Pathway Design announces micro-mainframe gateway products

WELLESLEY, Mass. — Pathway Design, Inc. last week introduced a family of gateway products for micro-to-mainframe communications that operate under AT&T's Unix Systems III and V.

Resident on Unix-based, multiuser microcomputers, Pathway's Unipath gateways reportedly will permit up to 32 devices to communicate with a variety of hosts in Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) and Binary Synchronous Communications (BSC) environments.

"We don't know of another Unix-based product which has gates to bisynch and SNA and offers several device-emulation capabilities concurrently," Pathway Design President Bob Broggi said.

Occupying 256K bytes of memory, Unipath provides value-added concurrent emulation of IBM 3270, 3770, 3780 and 2780 devices, Broggi said. The software allows users to toggle back and forth between an IBM host session and a Unix application with a single keystroke, he said.

Pricing will be in the $1,000 range, regardless of the number of users supported, according to Broggi. Initial shipments are scheduled for September.

Pathway plans a second release of Unipath that permits IBM host communications for 32 logical units, including IBM Personal Computers or intelligent terminals in SNA/SDLC and BSC networking environments.

Aimed at distributing processing effectively, this release "will place the presentation components of the software on the individual workstations, while maintaining the SNA communications gateway software on the supermicro," company Vice-President Timothy Wise said.

Pathway Design is located at 177 Worcester St., Wellesley, Mass. 02181.

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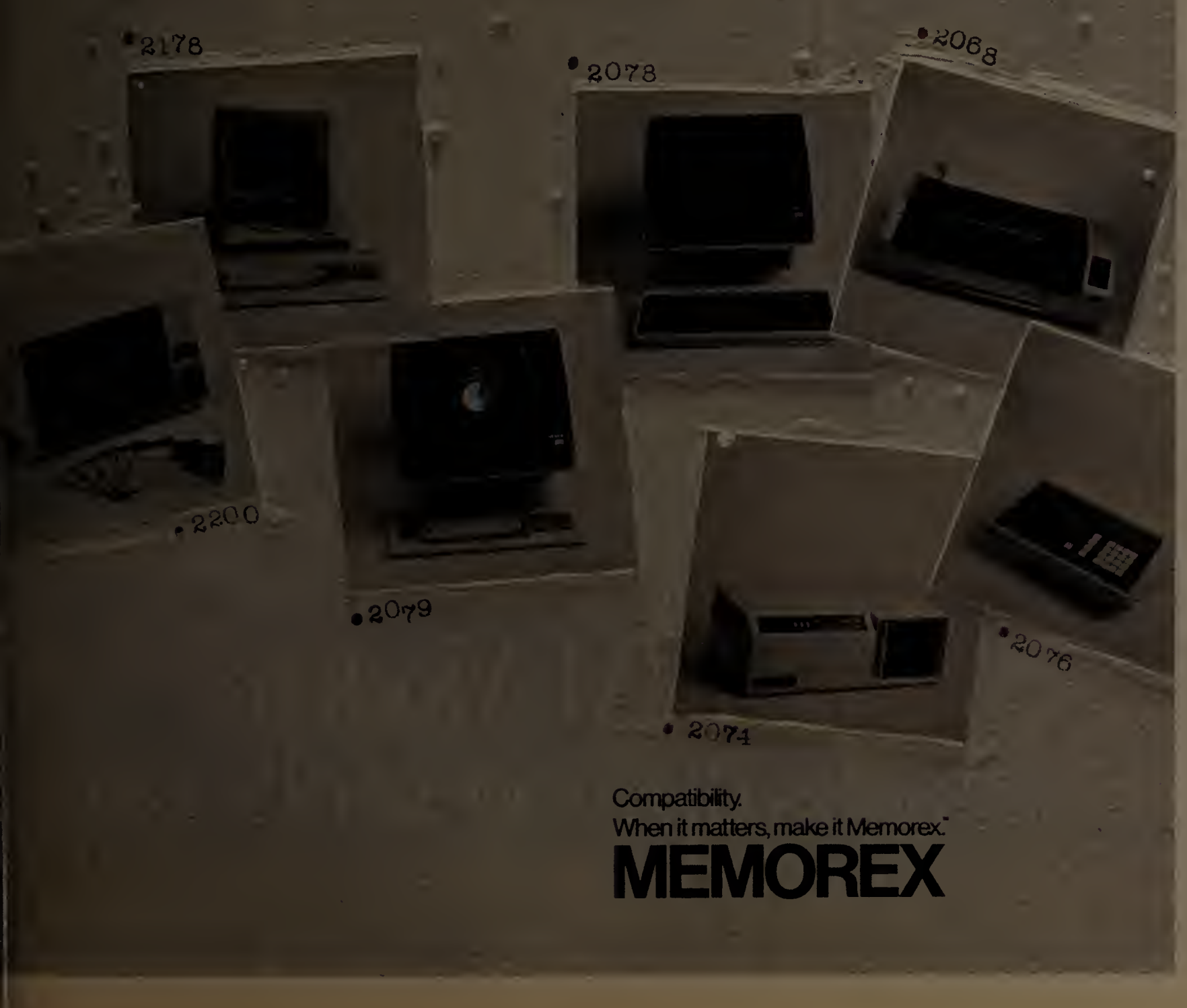

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SYSTEMS SOFTWARE

SOUTHWATER CORP.
VMbrowse

Southwater Corp. has announced software that permits users to browse and scroll IBM VM/CMS reports in full screen mode.

VMbrowse uses IBM 3270 or 3270-compatible terminals to provide formatted access to reports stored as VM/CMS disk files. IBM Personal Computers configured in 3270 communications mode may also be used in conjunction with the product, a spokesman said.

VMbrowse allows headings and descriptive columns to be frozen on the screen while data is scrolled horizontally or vertically using function keys. An option included with the software permits specified report lines, such as margin or subtotal lines, to be highlighted in a nonscrollable mode on output.

A permanent license for VM/CMS environments costs $2,450 for a single CPU. The purchase price includes one year of software enhancements.

Southwater, 30 Mowry St., Mount Carmel, Conn. 06518.

DATAMASTER COMPUTER SERVICE
Orbix Version 2

Datamaster Computer Service has announced a version of the Orbix Control Language. The enhanced Orbix for the Hewlett-Packard Co. HP 3000 computer gives fourth-generation language capabilities to HP's MPE operating system, the vendor claimed.

Orbix Version 2 offers multitasking capabilities that allow more than one process to be executed from a single computer session.

Cursor positioning and display enhancements can be displayed in connection with operator messages, and substitution parameters have

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SOFTWARE & SERVICES

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been added that will return time and day within an Orbix statement, the vendor said.

The price of Orbix Version 2 is $4,500 for a one-time license, which includes one year of phone support and software maintenance.

Datamaster Computer Service, 1215 Fifth St., Eureka, Calif. 95501.

SOFTWARE DIVERSIFIED SERVICES
IPCP/XM

Software Diversified Services has announced IPCP/XM, a new version of its Inter-Partition Command Processor (IPCP) software package for users of IBM's VM operating system or installations with multiple CPUs.

IPCP/XM allows CICS functions to be initiated from batch partitions running on any DOS/VSE machine, a spokesman said. Many CICS master terminal functions are supported, such as opening and closing files, enabling and disabling transactions, initiating transactions and placing terminals in or out of service, a spokesman said.

CICS commands can be routed from a batch partition to multiple CICS partitions at the same time using JCL. This allows users to dedicate an entire virtual machine to production CICS while running batch processing in other virtual machines, the company said.

The IPCP/XM package will run on any IBM 4300 or 30 series mainframe under IBM's DOS/VSE and CICS. It is priced at $90 for a monthly lease, $900 for a yearly lease and $1,800 for a one-time lease.

Software Diversified Services, Suite 308, 6401 University Ave. N.E., Minneapolis, Minn. 55432.

EMPACT SOFTWARE, INC.
Stop-X37

Empact Software, Inc. has announced Stop-X37, a utility program for users of IBM's MVS and MVS/XA operating systems.

According to a spokesman, Stop-X37 is designed to stop abends by intercepting the job at the time of the abend, dynamically searching out available disk space, allocating the space to the job and continuing the job without abending.

The user has complete control of which jobs are recovered and what recovery actions are taken, the spokesman said. A complete audit trail is provided that documents the job recovery action.

A permanent license for Stop-X37 is priced between $5,000 and $10,000, according to the vendor.

Empact Software, Atlanta Office, P.O. Drawer 1297, Stone Mountain, Ga. 30086.

DEMCHAK ASSOCIATES, INC.
Docref

Demchak Associates, Inc. has introduced a package that provides automated documentation for users of IBM's Advanced Branch Controller System. Docref runs on IBM's 360, 370, 30 and 4300 series and on plug-compatible mainframes under IBM's MVS, VM and OS operating systems.

Seven reports are included with the base system. Included are: the Transaction Composite Report, which lists all macros used to define a single transaction; and the Transaction Cross-Reference Report, which lists each macro and the transaction in which it is ultimately used, according to the company.

According to the vendor, Docref also has options that allow users to select specific transactions, groups of transactions, specific macros, groups of macros, report types and report sequences.

Docref consists of six modules and costs $5,000.

Demchak Associates, 1108 Livingston St., Turnersville, N.J. 08012.

TEKTRONIX, INC.
EZ-Test Software

Tektronix, Inc. has announced EZ-Test Software for creating software for test systems without learning a test programming language.

The product has two components: the Test Procedure Generator (TPG) and the Translator.

Loaded in a Tektronix 4041 system controller, the TPG is said to monitor all programmable test instruments via a common IEEE 488 bus.

The Translator component is used to convert verified TPG procedures into a 4041 Basic program that recreates the manual test procedure, the company said.

EZ-Test is said to accept

data from any IEEE 488 programmable test-and-measurement instrument that features primary addressing, Ascii-coded commands and line feed/end or identify message termination.

EZ-Test can be configured with the Tektronix 4105 computer graphics terminal or any RS-232C terminal compatible with the Ansi 3.64 standard. EZ-Test is priced at $500.

Tektronix, P.O. Box 500, Beaverton, Ore. 97077.

SOFTSYSTEMS, INC.
ICCF Control Facility

Softsystems, Inc. has announced the ICCF Control Facility (ICF), which provides security and management capabilities for IBM's Interactive Computing Control Facility (ICCF) package under IBM's DOS/VSE operating system. ICF provides the ability to control, manage and monitor access to ICCF source libraries, the company said.

Using ICF, an installation can secure the source of programs that have been placed into production by moving them to a production library. ICF, under the direction of a systems administrator, then controls and monitors any access to the production programs.

During maintenance, an existing production program must be checked out by a programmer, a process controlled by the systems administrator. When the modifications have been completed, a check-in procedure is initiated by placing the program in a staging library. If the operations staff accepts the program, the check-in process is completed.

ICF also provides an archiving feature that maintains older versions of a program while keeping track of the current version, the company said.

ICF monitors all activity that occurs during the maintenance process, providing a set of activity and status reports as well as current status information, which is available on-line.

A permanent license for ICF costs $2,500.

Softsystems, 311 Mallick Tower, One Summit Ave., Fort Worth, Texas 76102.

CONSUMER SYSTEMS CORP.
Databasic price increase

Consumer Systems Corp. has announced that, effective Oct. 1, it will increase prices of its Databasic utility system. Databasic is a utility package used to create, test and maintain IBM DL/I data bases.

The perpetual license fee for Databasic/OS, for IBM's OS operating system, will increase from $24,000 to $28,000. The version for IBM's DOS operating system will increase from $15,000 to $17,500.

To hold current pricing, Databasic must be installed and the standard perpetual license agreement signed by Sept. 30.

Consumer Systems, 1100 31st St., Downers Grove, Ill. 60515.

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sions and can be used to redesign any existing system or program.

The product runs under all IBM mainframe operating systems and is compatible with IBM's IMS/DB and DL/1 data base management systems (DBMS) and IBM's CICS. A version for Cullinet Software, Inc.'s IDMS DBMS will be available soon, the spokesman said.

The Intelligent Assistant is the first product from Leading Software.

The product is available now at a price of $350,000 from Leading Software Technologies, 26250 Euclid Ave., Cleveland, Ohio 44132.

The rack-mounted IBM 3868 Modem saves you space. And money. And effort.

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COMMUNICATIONS

Auditor's PBX boosts voice messaging services

PITTSBURGH — The local office of Price Waterhouse & Co., an international auditing, public accounting and management consulting firm, has considerably improved the efficiency of its voice messaging services by installing a digital private branch exchange (PBX) system here.

The system, which began operation late in 1981, is a 216-line, 40-trunk Focus Digital PBX, manufactured by American Telecom, Inc. of Anaheim, Calif. It was installed by Gray Communications, Inc. of Pittsburgh. The Focus PBX replaced an 11-year-old Centrex Corp. system.

The main problem with the Centrex system was that it lacked flexibility and did not make the most efficient use of the receptionist's time, explained Bernadette West, administrator of office services. There was also a need to handle each incoming call more promptly.

System flexibility

One indication of the Focus system's flexibility is the way it reroutes incoming calls to a message center when they are not answered by the called party. In the case of a senior staff member, the call is rerouted when the calling party gets a busy signal, as well as when there is no answer. For lower level staff, the transfer occurs only when the called party does not answer the telephone. This arrangement, West explained, helps prevent the message center receptionists from becoming overloaded.

Message routing capability is part of a hotel/motel feature package included in the Price Waterhouse Focus system. This software also enables the company's message center receptionists to activate an executive's message light directly — helpful when both he and his secretary are tied up.

The hotel/motel software controls a "calling/called number" display at the message center that shows whether an incoming call originated inside or outside the Pittsburgh office. This is an important feature for Price Waterhouse, West explained, because "in our business, we must have very professional telephone service. It has to be on the order of 'Good morning, Mr. Smith's office,' when a call comes in from the outside, rather than 'tax department.' "

The new system, besides handling messages more efficiently, provides much better cost control, she added.

SMDR subsystem

A Station Message Detail Recording (SMDR) subsystem analyzes daily traffic through a hard-copy printout that details originating station, time of call, duration and trunk used. SMDR is coupled with Zap-Call, from Telephone Management Systems, Inc. (TMS), of Waltham, Mass., which allows Price Waterhouse to bill clients for telephone services.

At the end of a conversation, the Price Waterhouse staff member enters the client's six-digit identification code, and the TMS system automatically records the related information. Later, Zap-Call summarizes this information for billing purposes.

Automatic route selection and remote system maintenance are two other features of the Focus system that have helped Price Waterhouse reduce its costs, West said. The former automatically selects the least costly route for long-distance calls; the latter allows the staff at Gray Communications to access the Focus system for minor software adjustments from a remote location, thus eliminating the need to dispatch a service technician.

INSIDE

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Mutual benefits ahead for SBS, IBM

DATA STREAM
John Dix
CW Senior Editor

If any company has the resources needed to see the ailing Satellite Business Systems (SBS) through its protracted adolescence, IBM does. Ditto for the company with the most to gain from a majority ownership interest in SBS.

The Communications Satellite Co. (Comsat) recently agreed in principle to sell its one-third share of the satellite carrier to co-owners IBM and Aetna Life & Casualty Co. for a rumored $60 million to $80 million.

Apparently, the strain of investment in SBS has grown too heavy for Comsat. Financing for SBS has exceeded $1 billion, $700 million of which has been evenly contributed by the three owners. Last year, SBS reported a loss of more than $140 million.

Exchange awaiting approval

In the exchange, which awaits the approval of the powers that be in Washington, D.C., IBM picks up 80% of Comsat's SBS share, thus increasing its overall stake in the company to 60%.

Reportedly, Aetna has the option to increase its share in SBS to 50%. It has also been said that the two companies may seek a third to fill in Comsat's shoes.

While the high cost of running the company may encourage the duo to find a partner with deep pockets, IBM might grow comfortable sitting in the driver's seat.

Closer relationship

A closer working relationship can only benefit SBS's sales efforts, but IBM could be the real beneficiary of such a deal. Consider some of the possibilities of such a relationship:

■ Bundled services. A recent Federal Communications Commission ruling allows IBM sales engineers to accompany SBS salesmen on sales calls, but the commission still prohibits the companies from bundling their respective products together at a lower cost than is normally available.

With added incentive, however, IBM might push for the removal of this order, which may be conceivable given the FCC's laissez-faire disposition of late — notably the lessening of its own Second Computer Inquiry decision regulations regarding separate subsidiary requirements for AT&T.

■ National network. SBS operates a backbone network of 20 earth stations through which it provides Skyline discount long-distance telephone services. Fleshed out, this predominately voice network — critical to any business — could provide IBM with a foot in the door of many medium- and small-size businesses.

Because it is an all-digitial network, it is potentially a solid foundation from which to build data services with low entry and operation costs.

■ Information network. IBM has been slowly creeping back in the computer services business with this network. Today, the company relies on high-speed Dataphone Digital Service circuits from AT&T to tie its respective network nodes together.

The use of high-speed SBS satellite links might enable the company to pare network costs and increase the services available.

Additionally, IBM may be encouraged to hasten to unbundle the network from the computer service to offer an alternative to public packet-switched networks that is as low-speed and low-cost as possible.

Fibronics sets ISN fiber-optics deal

HYANNIS, Mass. — Fibronics International, Inc. recently announced here that it will supply the fiber-optic components used in AT&T Information Systems' recently announced Information Systems Network (ISN).

These fiber-optic links are intended for use between wiring closets — which act as junctions for twisted-pair telephone wires at various locations throughout a building — and the heart of the local-area network called the central packet controller.

Under terms of the deal, Fibronics will supply AT&T with its FM1600 Cable Bandit, which AT&T will modify for use under its own label in the ISN.

Fibronics will continue to market the Cable Bandit, which enables up to 32 IBM 3270 or compatible peripherals to communicate over a single fiber-optic cable.

Competitors rap AT&T campaign

WASHINGTON, D.C. — AT&T's campaign to do away with the separate subsidiary requirement required by the Federal Communications Commission's Second Computer Inquiry is being criticized by AT&T's divested Bell operating companies and from nontelephone competitors.

A common theme to most of the comments was that the FCC's June 27 "resale" decision — allowing AT&T's nonregulated subsidiary, AT&T Information Systems, to market basic services — confers a significant marketing advantage on AT&T.

This, the chorus argued, should be carefully evaluated before the company is further unleashed through removal of the separate subsidiary requirement. Another key point was that despite AT&T's state-

See **AT&T** page 54

TODAY'S VAX FAMILY: UNPRECEDENTED COMPATIBILITY FROM THE DESK TO THE DATA CENTER.

Digital's VAX™ systems have earned an enviable reputation as the best-engineered computer family in the world. Since their introduction, VAX-11/730, VAX-11/750, VAX-11/780 processors and VAXcluster™ systems have set the industry standard for processor-to-processor compatibility.

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VAX-II/725

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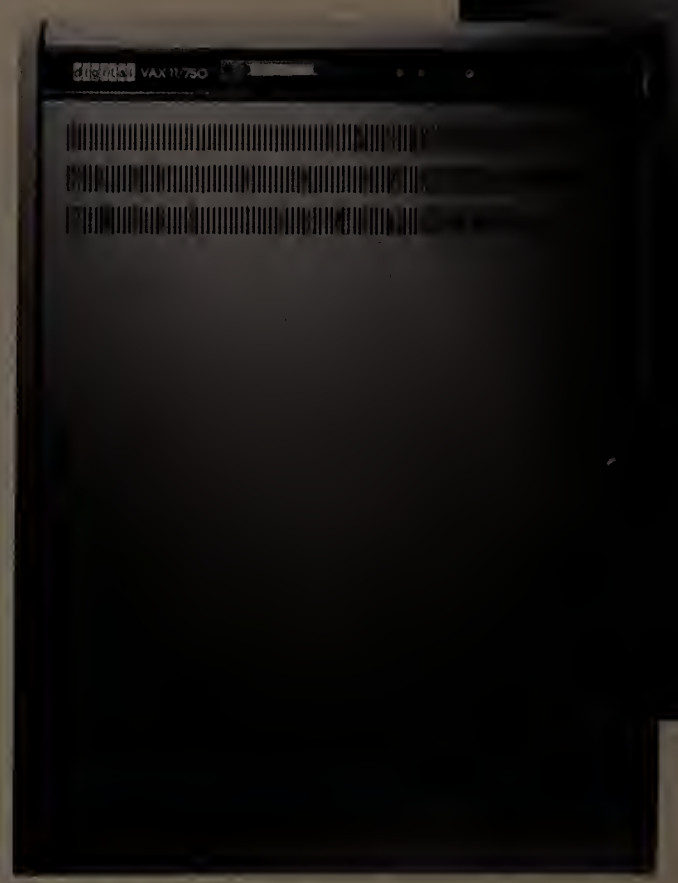

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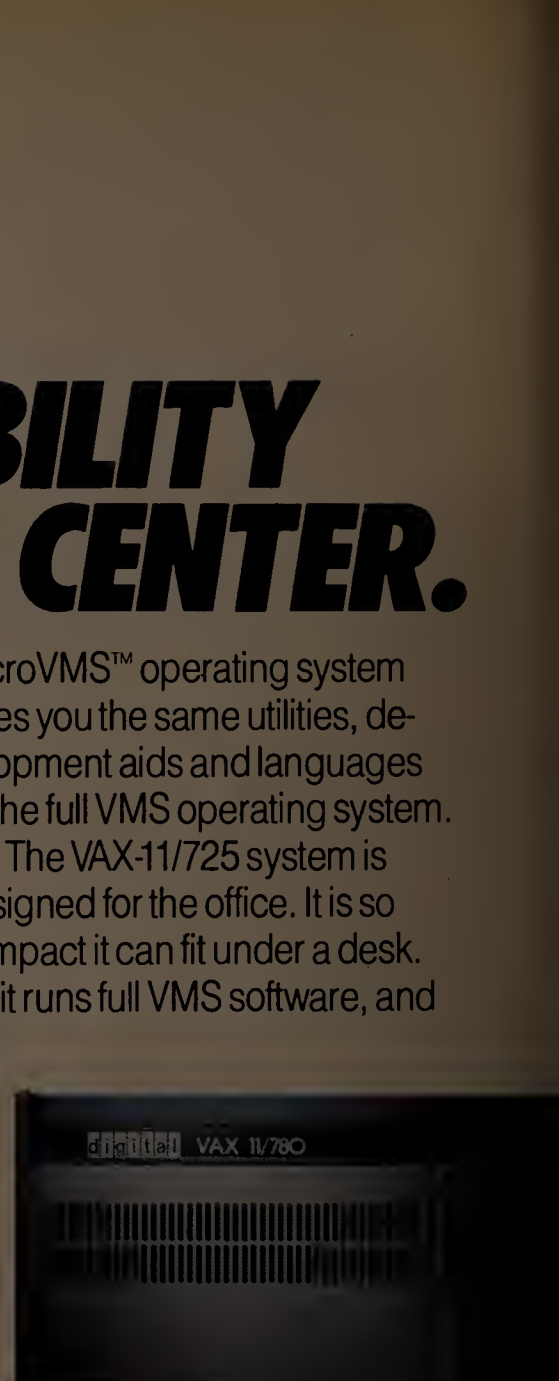

VAXclusters

VAX FAMILY COMPATIBILITY

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PROGRAM DEVELOPMENT.

VAX systems support APL, BASIC, BLISS, C, COBOL, CORAL 66, DIBOL,™ DSM (Digital Standard MUMPS), FORTRAN, PASCAL, PL/I, RPG II, LISP, OPS5 and Digital's MACRO assembly language.

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The chief advantage of the architectural compatibility we've engineered into every member of the VAX computer family is the return-on-investment it gives you. You can start anywhere and expand up or distribute down as your needs dictate. And you won't have to retrain, reprogram, restructure files or abandon the system you began with.

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DIGITAL COMMUNICATIONS ASSOCIATES, INC.
System 207

Digital Communications Associates, Inc. has introduced a network processor said to emulate the operation of Digital Equipment Corp.'s DMF-32 asynchronous controller interface, including both the character and direct-memory access mode output capabilities.

The System 207 DEC Unibus interface network processor is said to function with the vendor's other equipment to support a cluster of remotely located terminal users. The emulation is said to provide efficient data transfer from the host computer, using direct memory access techniques to transfer large quantities of data with low CPU overhead, the vendor said.

The System 207 consists of a single hex-size controller board that plugs into a Unibus small peripheral controller slot. It is said to support point-to-point trunk lines, each of which can communicate at rates of up to 19.2K bit/sec.

The system will be available in October 1984 for prices starting at $4,950, the vendor said.

Digital Communications Associates, 303 Technology Park, Norcross, Ga. 30092.

SOFTWARE

DATANEX, INC.
Hasp+ 4.0

Datanex, Inc., has introduced a new version of its Hasp+ communications software for Digital Equipment Corp. PDP-11 and VAX-11 computers.

Hasp+ 4.0 reportedly supports the DEC DMF32 combination board on VAX-11 systems and is said to reduce processing overhead by providing support for eight 56K bit/sec direct-memory access lines and a printer interface.

For VMS users, Version 4.0 reportedly offers several new features, including support for the automatic dialing of multiple remote sites and alternate numbers for the same site.

Jobs running under Hasp+ reportedly can be submitted from a remote location to VMS batch via the input stream on Hasp+ while it is operating in central mode. Because output is sent back on the print stream, any Hasp multileaving workstation can submit work to the VAX-11 that initiated the job entry.

Hasp+ 4.0 is priced at $5,500 for the first system. Multiple-system discounts are available.

Datanex, P.O. Box 1728, Eugene, Ore. 97440.

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AT&T from page 51

ments to the contrary, the company retains monopoly control over interstate communications.

According to Bell Atlantic, a regional holding company, business customers "overwhelmingly prefer a single point of contact for their communications needs." It pointed out that the FCC's resale decision conferred this status on AT&T Information Systems, and that removing the separate subsidiary requirement would do likewise for AT&T Communications, AT&T's regulated communication service.

The Independent Data Communications Manufacturers Association, which represents the nation's major modem manufacturers, attacked what it called "a jumble of statistics" served up by AT&T to suggest that competing carriers will soon have transmission facilities as extensive as AT&T's.

"For the foreseeable future," the association said, competing carriers will have to rely heavily on AT&T. This is because they lack the capital to build equally extensive facilities on their own and because equal access will erode their present pricing advantage.

In addition, customers in equal access areas who don't choose a specific long-distance carrier will be assigned automatically to AT&T.

Finally, IDCMA added that, "In light of the well-publicized backlog of several months for AT&T private-line service, if a customer believes that AT&T may vary the waiting period for installation of private-line service depending on the source of the customer's CPE [terminal equipment], this perception could become a potent factor in the customer's decision of whether to select AT&T equipment."

SYSTEMS & PERIPHERALS

Lisp system enhanced to run multiple CPUs

LOS ANGELES — Lisp Machine, Inc. has announced the Lambda 2x2/Plus, said to support the development or execution of Lisp, Prolog and Unix software simultaneously on three independent, concurrently executing processors.

The product features two Lisp processors and a Motorola, Inc. 68010 CPU and is supplied with two displays and artificial intelligence keyboards and a 474M-byte Winchester disk, the company said. The Lisp processors are said to feature a 32-bit tagged architecture and a 4K-byte write-through cache memory.

The 68010 CPU, which also features a 4K-byte write-through cache memory and 32-bit arithmetic and byte addressability, operates at 10 MHz and is capable of peak speeds of 1 million instructions per second, the company said. The 68010's virtual memory implementations are said to generate 24-bit virtual addresses, resulting in a 16M-byte virtual address space.

Software provided includes the company's Zetalisp-Plus for programming, which executes on Lisp processors; and Unix System V with virtual memory for the 68010 and support for C, Pascal, Fortran 77 and other traditional languages, the company said.

Optional eight- and 16-port RS-232 interfaces are available for multiuser Unix

See **LISP** page 58

Auto-Trol offers color CAD/CAM workstation

DENVER — Auto-Trol Technology Corp., manufacturer of turnkey computer-aided design and manufacturing systems, has announced a color version of its Advanced Graphics Workstation (AGW), the AGW III. It is based on an Apollo Computer, Inc. bit-slice pipeline 32-bit processor and has an integrated floating-point processor and a cache memory.

The AGW III is compatible with Autotrol's AGW I workstation family, which is based on the Motorola, Inc. 68000 microprocessor, and with the AGW II family, based on the Motorola 68010 microprocessor. It features 1M to 4M bytes of main memory with a 68M-byte or 158M-byte Winchester disk drive and a 1.2M-byte floppy disk drive, the company said.

The AGW III also features a 19-in. graphics screen with tilt-and-swivel control, a 12-in. alphanumeric screen; a keyboard, a thumbwheel or joystick module or 11- by 11-in. tablet and an optional menu function keyboard.

The modular packaging is said to make the components of the workstation free-standing and adaptable to various office spaces.

The AGW III uses Apollo's Aegis operating system and offers its own software packages for graphics applications. The Series 5000 Advanced Graphics Software is a command-driven system for the architectural and engineering marketplaces, the company said. The Series 7000 Advanced

See **AGW** page 58

Masscomp offers supermicro

By John Desmond
CW Staff

FRAMINGHAM, Mass. — Masscomp recently announced the MC-500DP series of real-time, dual-processor supermicrocomputers for scientific, engineering and technical applications.

Designed around Motorola, Inc.'s 68010 microprocessor and the company's version of Unix called RTU, the units are said to increase performance power by as much as 99% over Masscomp's single-processor systems.

The MC-500DP series has an architecture featuring two 8M byte/sec buses — an Intel Corp. Multibus and an STD bus. Each bus is said to support a 32-bit virtual memory CPU.

Supports two floating-point processors

The system also supports two floating-point processors, said to increase computational performance in multitasking, multiuser applications.

The target market for the MC-500DP series is in three areas: program development or time-sharing for users who want more horsepower; dedicated applications that need an additional CPU or data base access; and heavy data acquisition applications for real-time users, according to Allan L. Wallack, Masscomp vice-president of marketing.

The MC-500DP, which can support up to 16 users, consists of seven configurations: three workstations, one tabletop model and three cabinet models, according to Masscomp.

Architecture's other features

Other features of the architecture, also incorporated on Masscomp's single-CPU products, include: an integrated array processor; multiple independent graphics processors; a data acquisition unit, which can reportedly operate at up to 8 millions of instructions per second; a control processor; and an Ethernet communications processor.

The MC-500DP can support from 50M to 474M bytes of disk storage as well as ¼-in.

See **MASSCOMP** page 57

Adage to market stand-alone drafting system for Cadam software users

By John Desmond
CW Staff

BILLERICA, Mass. — Adage, Inc. has announced it is marketing and servicing a stand-alone design/drafting system for Cadam, Inc.'s Cadam computer-aided design (CAD) and manufacturing software users. software users.

Developed and manufactured by Adra Systems, Inc. of Lowell, Mass., the 2/50 is based on the Motorola, Inc. 68010 microprocessor and an Advanced Micro Devices, Inc. 29116 bit-slice microprocessor-based geometry engine, which performs the system's mathematical, geometric and display functions. The geometry engine is said to operate at approximately 6.5 millions of instructions per second. The 2/50 also features 1M byte of memory and 5¼-in. floppy disk storage, the company said.

The 2/50's Cadra-1 software, developed by Adra, is said to operate independently of the host CPU, needing to communicate with the host only for file transfer of drawings or while emulating an IBM 3278 Model 2 terminal. The software is also said to access the Cadam data base via the Geometry Interface Module to provide most of the functions of the Cadam CAD-Only interactive modules and to allow users to generate drawings locally.

The 2/50's 19-in. color raster scan display monitor is 60Hz noninterlaced and features resolution of 1,024- by 1,024 pixels by 4-bit planes and a graphics area of 11- by 11 in., the company said. The system is said to support a light pen and 32 function keys, as well as an optional data tablet and dot matrix printer. No special

See **ADAGE** page 58

IBM bar code unit said to automate check sorting

By John Desmond
CW Staff

RYE BROOK, N.Y. — IBM recently announced optical bar code technology said to automate the return check procedure for banks with the check sorting IBM 3890 Document Processor. The unit uses an infrared fluorescent ink bar code that the company said can be read even when overprinted with standard bank endorsements.

Scheduled to be available in the second quarter of 1985, the 3890 Document Coding Feature, which attaches to the 3890 Document Processor, prints a bar code endorsement on each check when it is collected. When checks are returned to a bank that uses the document coding feature, the processor automatically identifies the source of the checks and returns them, the company said. Thus, an institution using the 3890 coding can automate its check return system even if other institutions handling returned items continue manual operations, IBM said. In the manual procedure, banks must determine the previous point in the collection chain for returned checks, trace the items to that source and prepare related paperwork, according to IBM.

Each check that is passed through a 3890 with the coding feature is printed with a 26-character bar code and an eight-digit number. The 26 characters are said to contain all the data needed to trace the source of a returned check. This data includes an eight-character field typically containing the customer's account number or bank routing/transfer number, the date the check was recorded, the sequence number assigned to the check on the prime pass through each machine and the bank originating the bar code. The eight-digit number repeats the section of bar code with the sequence number for use during manual audits or special searches for a check.

The document code reader is said to locate automatically previous bar code endorsements on each check and select an adjacent print position. The 3890 with the coding feature can print up to six bar codes on each check, the company said.

The Check Processing Control System/Return Item Feature (CPCS/RIF) package controls the returned item processing application. The program functions

See **IBM** page 58

■ Pyramid Technology Corp. added cache and floating-point devices to its product offerings/**56**

INSIDE

Data Storage/**56**
Terminals/**57**

SYSTEMS & PERIPHERALS

Intermem offers memory system for Cray CPUs

POUGHKEEPSIE, N.Y. — Intermem Corp. has announced the 8330 memory system, an external memory subsystem for Cray Research, Inc. supercomputers. The subsystem is said to provide up to 1G byte of memory while occupying a floor space of 30- by 65 inches.

The unit offers up to eight ports that can be attached to the high-speed, synchronous channels of the Cray system, the company said. If the four ports are attached to four high-speed, asynchronous channels, the transfer rate is quadrupled, the company said. The access time of the memory system is less than 5 microseconds, the company said.

The 8330 was designed with single-bit error correction and double-bit error detect circuitry, the company said. It has an integrated microcomputer-controlled test system that includes an error stack and a printer for error logging of intermittent as well as solid errors, the company said.

Overall meantime between failures is said to be extended by replacing memory chips that exhibit intermittent failure during preventive maintenance. The 8330 is suited for swapping large data arrays or program modules in and out of the main memory, the company said.

The four-million word version costs $650,000, and the 128-million word (1G-byte) version costs $3.4 million, the company said.

More information is available from Intermem, 47 Dutchess Tnpk., Poughkeepsie, N.Y. 12603.

Pyramid units said to double 90X's performance

MOUNTAIN VIEW, Calif. — Pyramid Technology Corp. has introduced data-cache and floating-point units that reportedly double the performance of its 32 bit/sec Unix-based 90X superminicomputers for scientific applications.

The company also introduced a 4M-byte and 2M-byte memory board that reportedly doubles the memory of the 90X.

The floating-point unit reportedly makes Pyramid the first supermini to adopt the IEEE-754 standard for floating-point representation.

The Model 4110 data-cache unit is said to speed up access to memory-resident data structures. The 4110 has 32K bytes of memory within the Pyramid 90X CPU, in addition to the standard 4K-byte instruction cache.

According to the vendor, the effect of the data-cache unit depends on the application, but performance can be improved by 20% to 30% or more on applications that access large memory-resident data structures, the vendor claimed.

The Model 4110 floating-point unit can be added to any 90X CPU with data cache to improve the speed of floating-point intensive applications by a factor of two or more, the vendor said.

The use of the IEEE standard format reportedly ensures the interchangeability of floating-point data files between Pyramid systems and other systems that also use the IEEE format for floating-point representation.

The data-cache unit is priced at $14,500. The cost of the floating-point unit is $8,500. Both are available 30 days after orders are received.

Both the 4M- and 2M-byte memory boards use 256K-byte random-access memory chips and can be used without modification on the system's memory control unit.

The 4M-byte board costs $22,000, and the 2M-byte board sells for $11,500.

Pyramid Technology is located at 1295 Charleston Road, Mountain View, Calif. 94043.

DATA STORAGE

PLEXUS COMPUTERS, INC.
Storage Expansion Module

Plexus Computers, Inc. has announced the Storage Expansion Module (SEM) for users of its P/35 Unix-based supermicrocomputers, said to offer an additional 145M bytes of memory on a Winchester disk drive.

The SEM is said to double the maximum storage capacity of the P/35 to 435M bytes. The SEM is available either as an expansion of the current 72M-byte system or as an option in an existing P/35, the company said.

A P/35 system with a 145M-byte Winchester disk drive, 60M-byte streaming cartridge tape, 512K-byte error correction code, eight user ports and a 12.5 MHz Motorola, Inc. 68000 microprocessor, costs $27,950, the vendor said.

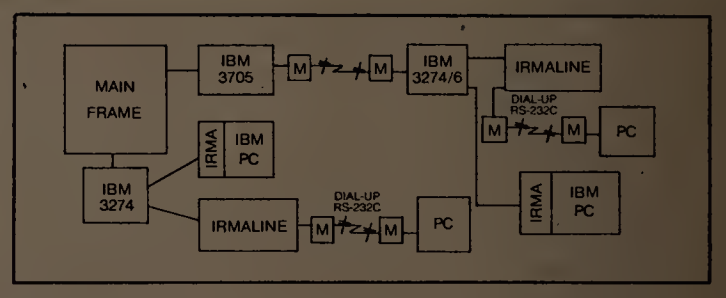
Plexus Computer, 2230 Martin Ave., Santa Clara, Calif. 95050.

ACTION COMPUTER ENTERPRISE, INC.
Discovery 1604 Model H

Action Computer Enterprise, Inc. has announced the Discovery 1604 Model H storage array for combining floppy disks and hard disks in one modular, mass storage unit for the company's Discovery 1600 supermicrocomputer.

Continued on page 57

Here are two beautiful ways to get small computers on line with the mainframe quickly, easily and economically—yours from DCA, home of the industry's first co-axial cable links between small computers and IBM 3270 networks.



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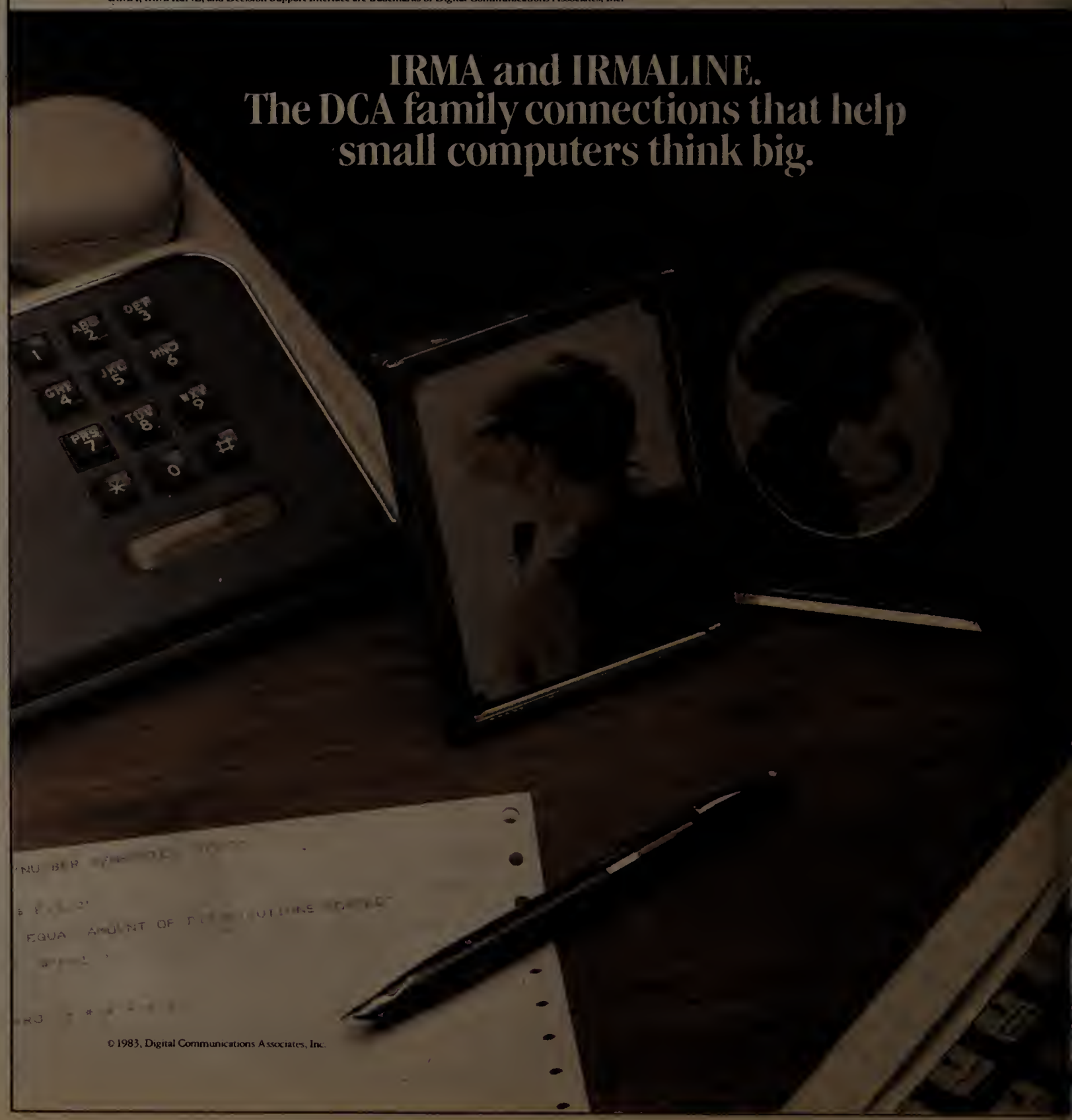

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SYSTEMS & PERIPHERALS

Continued from page 56

Intended for the data storage demands of a multiuser environment, the 1604 offers hard disk storage capacity of up to 210M bytes, the vendor said. The 1604 houses up to four 65M-byte hard disk drives, or up to four 5¼-in., 1M-byte mini-floppy drives, the vendor said.

The average access time is said to be 32 msec for each drive. Multiple read/write heads on the 1604 are said to improve system throughput over a single drive with equivalent storage capacity.

The 1604 features a built-in power sequencer to ensure that all drives are powered up in the correct order, the company said.

The tabletop 1604 with 65M bytes (53.5M bytes formatted), hard disk and SCSI controller costs $6,150; the price with two 65M-byte hard disks is $9,680, the vendor said.

Action Computer Enterprise, 430 N. Halstead St., Pasadena, Calif. 91107.

TERMINALS

CALMA CO.
Display-Only Terminal System

Calma Co., a subsidiary of General Electric Co., has announced a Display-Only Terminal System (Dots) said to provide remote access to graphics information from a host Calma computer-aided engineering, design or manufacturing system based on Digital Equipment Corp. VAX-11 superminicomputers.

The terminal connects via a standard RS-232 interface, the company said. The product features a 13-in. color screen with a resolution of 640 by 480 pixels, and local zoom and pan resolution is said to be enhanced by an addressable display matrix of 4,096 by 4,096 pixels, the company said.

The list price for one Dots terminal and applicable software is $14,000, the vendor said.

Calma, 2901 Tasman Drive, Santa Clara, Calif. 95050.

SIGMET, INC.
RGB-4

Sigmet, Inc. has announced the RGB-4 color display system for Hewlett-Packard Co. HP 1000 minicomputer users.

The unit allows direct connection to HP's 12006B parallel interface card and features resolution of 648 pixels by 480 pixels by 4 bits deep and a choice of 4,096 color tints and intensities.

The RGB-4 has a set of 17 firmware commands, such as pan, scroll and 2X zoom to facilitate image display, solid- and dashed-line drawing and character drawing from two complete fonts, including Greek, the company said.

Uses with RTE-A are also assisted by the optional Fortran 77 firmware driver package. A 16-word by 12-bit read/write color random-access memory aids the selection of tints and intensities, according to the company.

The standard RGB-4 system, including a 19-in., 60Hz, interlaced, long-persistence color monitor, costs $8,800, the vendor said.

Sigmet, 271 Great Road, Acton, Mass. 01720.

IRMALINE™ does the same for remote IBM PCs, IBM PC XTs, Apple Lisas and DEC Rainbows, among others, with just a local phone call to a nearby 3270 controller.

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MASSCOMP from page 55

tape cartridge and ½-in. tape drives. The units can support up to 6M bytes of main memory with ECC. Up to three graphics subsystems can be supported as well, the vendor said.

The MC-500DP uses an asymmetrical (master/slave) system based on dual-processor extensions to the company's real-time Unix operating system. The software is said to support Masscomp's menu system, window management system, graphics software and languages including Fortran, C and Pascal.

The dual-processor configuration is said to provide more throughput for real-time, multitasking applications; for engineering applications, the dual-processor workstation is said to allow the user to develop schematics on one processor while running a logic simulation or circuit simulation on the second. Or a mechanical engineer could run a two-dimensional drafting package on one CPU while running a finite-element analysis program on the second CPU, according to the company.

The system will automatically distribute the computing load between CPUs, or the user can define which tasks are to be run by each CPU to achieve maximum performance, the company said. In addition, each CPU on the MC-500DP can run a separate floating-point processor, the company said. Such performance rivals that of the Digital Equipment Corp. VAX-11/780, according to a Masscomp spokesman.

The MC-500DP will be delivered in November, the spokesman said.

The lowest cost system, the MC-531DP tabletop, is priced at $36,900 in single-unit quantities. The MC-531DP includes two CPUs; 2M bytes of ECC memory; a 50M-byte disk; a 1M-byte, 5¼-in. floppy disk; a 15-slot backplane; an alphanumeric terminal; five serial lines; multiprocessor, Unix-based software; and the Fortran and C languages.

A typical high-performance workstation configuration — two CPUs, 2M bytes of ECC memory, a floor-standing pedestal, a 15-slot backplane, a 50M-byte disk, a 1M-byte floppy disk, 1,000- by 800-pixel resolution, a mouse, a floating-point processor, five serial lines and the same software — is priced at $47,000 in single-unit quantities, the vendor said.

More information is available from Masscomp, One Technology Park, Westford, Mass. 01886.

SYSTEMS & PERIPHERALS

ADAGE from page 55

power requirements are needed, the company said. The CPU, local memory, geometry engine and disk drive are housed in a floor-mounted tower chassis, the vendor said.

The 2/50 connects to an IBM 3274 control unit, IBM 3276 control unit display station or equivalent, via an IBM Type A or equivalent coaxial cable.

The 2/50 can communicate at rates of 2,400 bit/sec to 56K bit/sec, depending on the control unit used, the company said.

The operator has a choice of one of three operating environments: local CAD, 3278 emulation mode or concurrent CAD and 3278 modes.

The user can alternate between CAD and 3278 display screens or optionally display a 3278 window on the CAD display screen, the company said.

The 2/50 is priced at $21,900, with initial deliveries scheduled for the fourth quarter, the vendor said.

Asked at a press conference in Adage offices here to specify the installed base of Cadam users, Adage President Richard N. Spann said he believes that over 400 Cadam licenses have been issued.

Additional information can be obtained from Adage, which is located at One Fortune Drive, Billerica, Mass. 01821.

IBM from page 55

include: reading the magnetic ink character recognition code line on the face of the check and the 3890 bar code on the back of the check; building a machine-readable file for the source of each check; building and using a data set for any special processing rule for each item; permitting automatic preparation of advisory notices to be sent to depositors with the returned items; and automatically printing lists of items being returned.

The Document Coding Feature costs $170,000, the vendor said. The CPCS/RIF licensed program has an initial license charge of $8,250 plus a monthly fee of $825, and maintenance for the document coding feature is $1,500/mo, the vendor said.

IBM announced the product through its Information Systems Group, which is located at 900 King St., Rye Brook, N.Y. 10573.

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TECHNOLOGY FOR THE AUTOMATED GENERATION OF SYSTEMS

TAGS

TELEDYNE BROWN ENGINEERING

AGW from page 55

Graphics Software is a menu-driven system for the manufacturing and mechanical marketplaces. Specialized applications are also available, the company said.

The AGW workstations can be connected on a network, or they can operate independently, the company said.

The AGW III costs $100,200, the vendor said. The price includes a license for one of the two software series. A second series can be licensed for $7,500, the vendor said.

More information is available from Auto-trol Technology, P.O. Box 33815, 12500 N. Washington St., Denver, Colo. 80233.

LISP from page 55

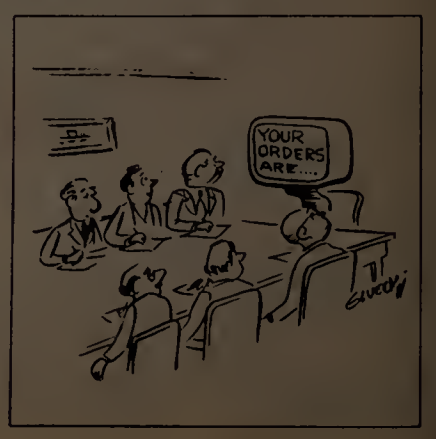
operation, the company said. Also included is the company's Extended-Streams interface for communications at 37.5M byte/sec between programs on any or all three of the processors during parallel operation.

The Lambda series also features an integral Intel Corp. Multibus, which allows a choice of lower cost, third-party peripherals for configuring the system and an optional Xerox Corp. Ethernet-II interface for communications with other CPUs.

With 4M bytes of memory, the Lambda 2x2/Plus is priced at $140,000, with a quantity price of $112,000 available, the vendor said.

LMI Leasing Corp. will lease the machine, Lisp Machine said. Upgrades from the company's Lambda 2x2 start at $30,000, the company said.

Lisp Machine is located at 6033 W. Century Blvd., Los Angeles, Calif. 90045.



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Derek

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ring again
trans conf
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conf 6
call fwd
4274
4274
vol up
vol down
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ABC 2
DEF 3
GHI 4
JKL 5
MNO 6
PRS 7
TUV 8
WXY 9
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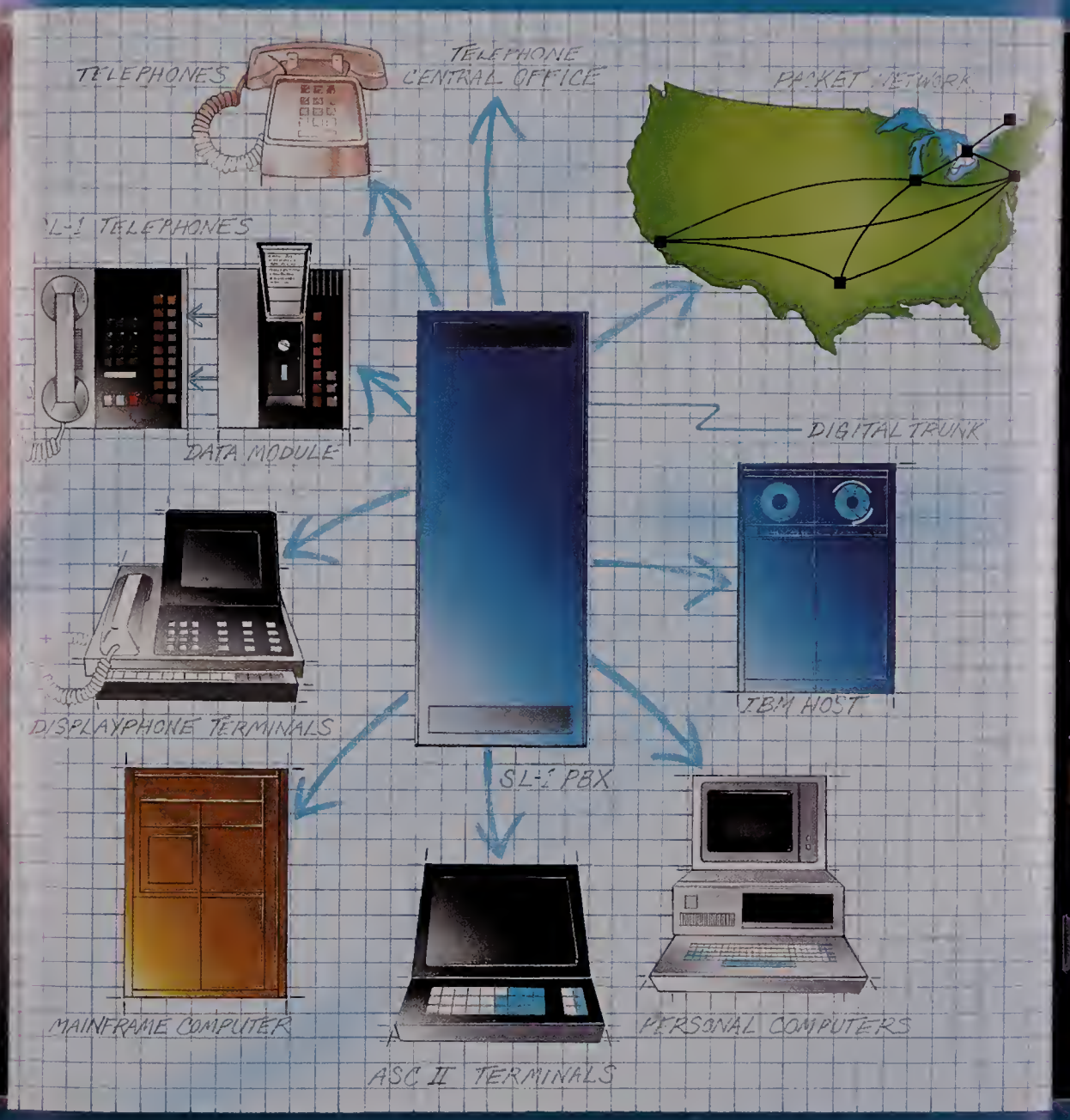

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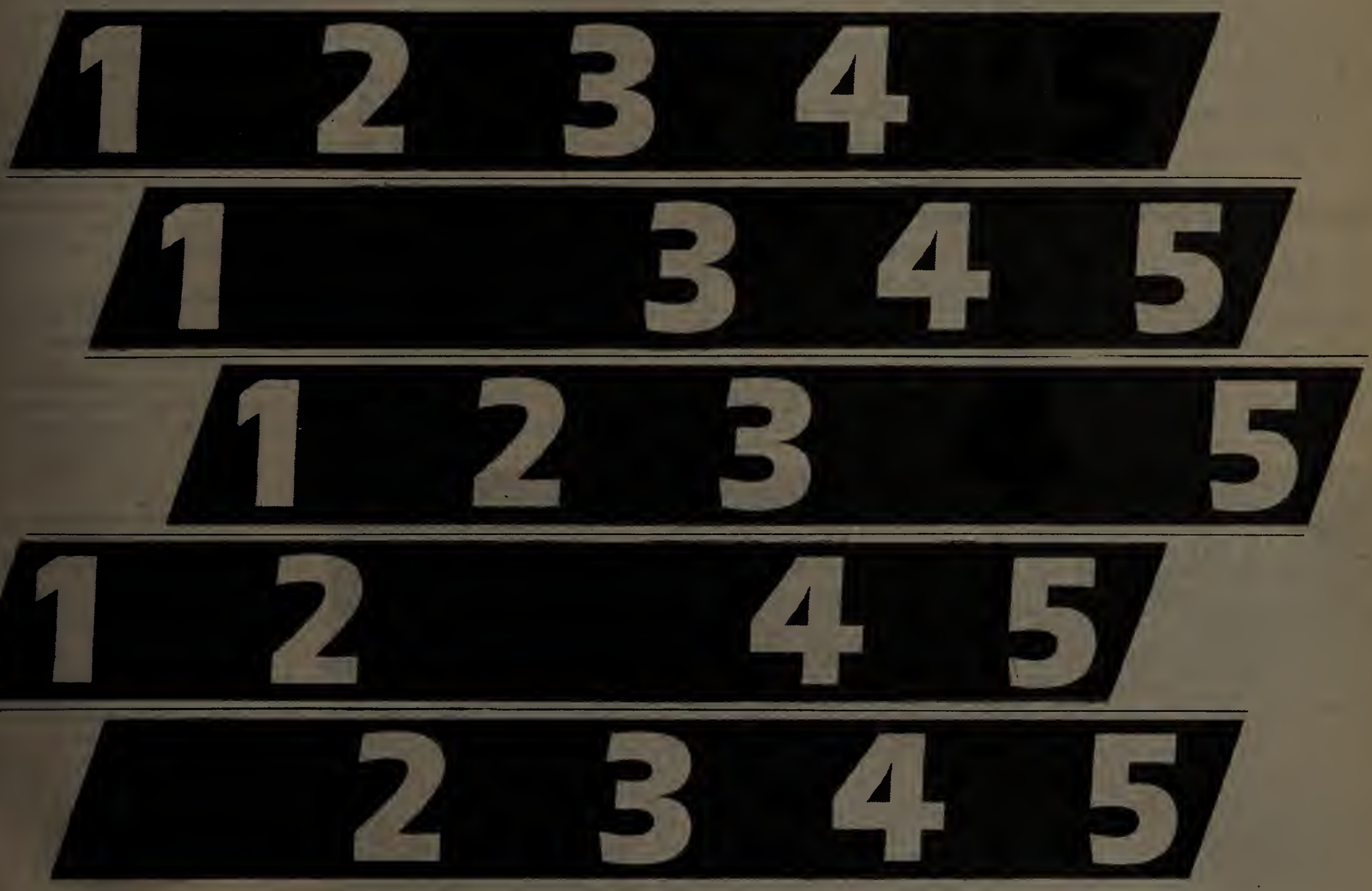

Leading or lagging? (a questionnaire)

Is your department on the leading edge or is it lagging behind? How can you evaluate? This questionnaire is aimed at managers of computing facilities who want to measure themselves against the practices of their peers in both large and small companies.

By Capers Jones

From time to time, it is worthwhile to take stock of where the industry is heading and your relationship to the changing technologies and policies. What concepts and methods have proven their value and which are emerging?

The following questionnaire consists of 20 sections and 261 questions dealing with methods, policies and practices that are either at the leading edge in mid-1984 or have gathered enough momentum to reach that status soon.

Questionnaires like this one have a short life expectancy. In a few months, new items should be added; within a few years, probably half of the current topics will be obsolete, and concepts barely envisioned in 1984 will be entering the mainstream.

The questionnaire is a self-evaluation aimed at managers of computing facilities. The questions are scored on a five-point scale with "1" meaning that the item is not used or does not exist at the enterprise and "5" meaning that it exists as a standard part of doing business.

Possible scores range from 261 to 1,305. For Fortune 500 corporations, typical scores run between 500 and 700. A total of more than 800 indicates significant leading-edge capabilities; more than 1,000 would mean notable emphasis on exploration of new methods.

For smaller enterprises (less than 20 employees on the systems staff), scores run between 400 and 600, with above 700 being significant

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and more than 900 meaning very active exploration of new methods.

Regardless of the numerical score, the questionnaire is intended to serve as a checklist for some of the more interesting technical and policy issues affecting data processing.

Planning, estimating and controls. In 1984, the traditional informal and manual methods for planning and monitoring software projects are starting to become obsolete with the rise of expert systems that can handle cost estimating and project tracking faster, more accurately and with less effort.

Strategic planning and the recognition that computers are the most powerful tools in history for both assessing trends and performing competitive analysis are making enterprise planning a technology that cannot be ignored.

New measurement techniques, divorced from the historical problems of dealing with lines of source code, are starting to become industry norms. The function-point method of A.J. Albrecht of IBM leads the way in commercial systems, and the McCabe structural complexity method has become a significant topic in software engineering circles.

The scoring range for this section is from 18 to 90, with a score above 50 implying leading-edge methods and less than 25 implying no particular use of the most current methodologies.

Planning, estimating and controls

1. Long-range strategic planning for enterprise and major enterprise units ____
2. Formal system development methodology ____
3. Corporate or local standards for software projects ____
4. Standards enforcement for software projects ____
5. Formal job request and job prioritization methods ____
6. Automated cost and schedule estimating ____
7. Automated work breakdown structures (Pert/Gantt and so on) ____
8. Automated milestone tracking for software projects ____
9. Automated cost accounting for software projects ____
10. Formal project phase reviews ____
11. Software quality measures for development and maintenance ____
12. Software complexity metrics ____
13. Function-point metrics ____
14. Software productivity measures for development and maintenance ____
15. On-line enterprise planning calendar ____
16. Analysis of costs and schedules of past systems and programs ____
17. Project post-mortems ____
18. Annual summaries of progress during year and plans for following year ____

Total ____

Requirements and design methods. Software requirements and design methods evolved rapidly. For information systems, the data analytic methods of Michael Jackson, Kenneth Orr and Jean-Dominique Warnier are widely used. Many shops are applying one of the growing family of structured design methods based on the work of Larry Constantine, Glenford Myers, Wayne Stevens and, more recently, Tom De Marco.

A hybrid methodology, starting with data analysis for requirements and switching over to structured design later, is also popular. For the more stringent design requirements of real-time and military software, the formal mathematically based design methods, such as those of Harlan Mills, are in widespread use. In all cases, new automated tools offering integrated text and graphics support, plus editing and consistency checking, are starting to replace manual design methods. In a few particularly advanced enterprises, such as the IBM Research Division, direct production of executable programs from graphics source languages is now being explored.

The scoring range for this section is from 10 to 50, with anything more

IN DEPTH/LEADING OR LAGGING?

than a 30 implying leading-edge methods and less than 15 implying no particular use of the most current methodologies.

Requirements and design methods

1. User sign-off on requirements ____
2. Data-analytic design methods (Jackson, Warnier/Orr and so on) ____
3. Structured design (Yourdon, DeMarco and so on) ____
4. Prototyping ____
5. Interactive text/graphics tools for design creation and updating ____
6. Interactive syntax checking and editing of design ____
7. Interactive control flow, data analysis and consistency checking of design ____
8. Program "blueprints" ____
9. Formal requirements methods ____
10. Pseudocode ____

Total ____

Purchased software evaluation. With an estimated 30,000 application and system programs on the market, the evaluation and selection of purchased packages is becoming one of the major concerns of the industry. In several major corporations, the annual cost of package evaluations exceeds $500,000. The costs of leasing and purchasing packages are becoming enormous. In one Fortune 500 corporation, more than 30% of the entire library of running systems was purchased for a cumulative cost exceeding $50 million.

A sign of sophistication for large enterprises in 1984 is a software evaluation department. Even small companies recognize that package evaluations need to be put on a professional, business-like basis.

The scoring range for this section is from 10 to 50, with more than 30 indicating leading-edge methods.

Purchased software evaluation

1. Formal "make or buy" decision point in system development methodology ____
2. Review of published evaluations (Auerbach, Datapro and so on) ____
3. Surveys of current customers ____
4. Attendance at user groups ____
5. Formal on-site evaluation ____
6. Formal corporate licensing plan and standard contracts ____
7. Catalog of evaluated packages ____
8. Commercial evaluation service(s) ____
9. Internal evaluation department ____
10. Formal common software library across enterprise ____

Total ____

Code development. A virtual explosion of alternatives to conventional programming is occurring. New products calling themselves fourth-generation languages (or old products renaming themselves) are appearing at a rate of 15 to 20 per year. Libraries of standard functions and reusable code are beginning to become recognized tools of the trade. Also, the 100 or so spreadsheet processors and integrated multicapability end-user tools are giving computer power to a large percentage of knowledge workers.

Finally, the aesthetic appeal of the graphics interfaces used on the Xerox Corp. Star, Apple Computer, Inc. Lisa and Apple MacIntosh have focused attention on the method used to create these interfaces: a new kind of programming called object-oriented programming, embodied in languages such as Smalltalk and Objective-C.

The scoring range for this section is from 14 to 75, with a score above 50 implying leading-edge methods and less than 25 implying no particular use of these current methodologies.

Code development

1. High-speed prototyping ____
2. Internal reusable code library ____
3. Commercial reusable code tools (Hogan, Readycode and so on) ____
4. Structured coding methods ____
5. Application or program generators ____
6. Fourth-generation languages ____
7. Data base query languages ____
8. Standard functional packages (SAS, IMSL and so on) ____
9. Spreadsheet processor(s) ____
10. Information center(s) ____
11. Development center(s) ____
12. Object-oriented languages ____
13. End-user programming support group ____
14. Individual terminals or workstations for technical staff ____

Total ____

Data base design, development. In the data base world, 1984 might be remembered as the year of relational data bases, since more than a dozen commercial relational packages have been introduced that run on everything from mainframes to lap-size computers (yes, even the Radio Shack Corp. TRS-80 Model 100 has a new relational data base from Travelling Software).

However, despite the glamour of the relational concept, data base technology is about to be revolutionized within a few years by an even more significant change: the emergence of the new high-volume data storage methods such as Bernoulli effect disks, perpendicular magnetic recording and, above all, high-density optical disks and optical strips.

These high-volume storage media will reduce storage costs to such low levels that they will totally change the fundamental concept of a data base. Tomorrow's data bases will hold images, graphics and voice records as well as alphanumeric information.

The changes needed to accommodate these new record types may well trigger entirely new concepts in the areas of data dictionaries and entended header records, which as a by-product may facilitate data transfer among competitive and "alien" data base products.

Scores for this section range between 15 and 75. More than 40 implies leading-edge methods; less than 25 indicates minimal use of current methodologies.

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Data base design, development

1. Active on-line dictionary ____
2. Data base administration function ____
3. Enterprise business data analysis ____
4. Enterprise data dictionary ____
5. Data base development tools ____
6. Support for microcomputer data interchange ____
7. Support for subsetting mainframe data bases for microcomputer users ____
8. Relational data base(s) ____
9. Hierarchical data base(s) ____
10. Network data base(s) ____
11. Extended data base(s) (graphics, images and so on) ____
12. Planning for optical disks ____
13. Long-term data retention plan ____
14. Use of commercial information data bases (such as Lexis, Dialog, Dow Jones) ____
15. Document digitizer and associated recall and scanning facilities ____

Total ____

Data center and production management. Generally speaking, computer center management has been running ahead of almost any other technical area in terms of sophistication and the availability of useful tools. The computer manufacturers themselves have been partly responsible for this, as have the vendors of support tools and products. Data center management has been highly visible and a subject of concern since the 1960s. In 1984 it is possible to go through large enterprises that are primitive in software development, but whose data centers are models of efficiency and effectiveness.

However, data center management is one of the major points of difference between large enterprises and small ones. Small enterprises may have no data center at all and use either microcomputers or minicomputers, with little or no operational support required.

The scoring range for large enterprises in this section is 10 to 50, with anything more than a 40 implying leading-edge methods and anything less than 25 implying no particular use of the current methodologies.

For small enterprises that have no data centers, this section should be omitted from overall scoring.

Data center/production management

1. Automated capacity planning ____
2. Automated job scheduling ____
3. Automated production monitoring ____
4. Automated abend monitoring ____
5. Automated production statistics ____
6. Automated job charge system ____
7. Automated response time monitor ____
8. Analysis of portfolio ____
9. "Tuning" of high-usage programs ____
10. User satisfaction surveys ____

Total ____

User documentation. User documentation for both hardware and software has always been a chronic source of dissatisfaction. Consider the four basic reasons: The concepts to be described are intrinsically complex. Many enterprises have no professional technical writers to assist in software or hardware documentation. The worldwide supply of qualified technical writers is fairly small. Text is not the best method for explaining some software concepts clearly, but graphics tools have not often been used, either because of convention or cost.

The Xerox Star and Apple Lisa use "icons" or graphics symbols to facilitate use. But the popularity of the Macintosh microcomputer in particular has alerted the industry that there are better ways of handling user documentation than ordinary manuals and text-based screen menus.

Although only a few leading-edge enterprises in 1984 have the capabilities to create "iconographic" user interfaces for their own software packages, the technology for doing this is about to become a major new field. The technology is derived from the work of Alan Kay and the Xerox

IN DEPTH/LEADING OR LAGGING?

Research Center in Palo Alto, Calif. The first language for dealing easily with icons was Smalltalk 80. Such object-oriented languages no longer deal with procedures and data declarations, but rather with a new class of "objects" that couple data and procedures together, with the useful by-product of being able to create new programs and systems by joining reusable objects together.

The scoring range for this section is from 15 to 75, with more than 50 implying leading-edge methods, and less than 25 indicating no particular usage of the latest methodologies.

User documentation

1. "Iconographic" on-line graphics ____
2. Screen and menu generation tools ____
3. Predefined document outlines ____
4. Predefined document contents ____
5. Standard protocols for on-line Help functions (common syntax, key usages and so on) ____
6. Interactive text/graphics tools ____
7. On-line spelling checkers ____
8. Automated document library ____
9. Automated text processing ____
10. Automated typesetting ____
11. Automated slide and viewgraph ____
12. Microfiche production ____
13. Documentation digitizer(s) ____
14. Paperwork reduction planning ____
15. User satisfaction survey or user comment forms ____

Total ____

User training and education. Not far behind user documentation as a source of dissatisfaction has been the kind of training and education available for users of new computers and software products. For a majority of the computer equipment and software packages created since the industry began, it would probably be impossible to learn the product thoroughly from only the supplied documentation. A relatively large subindustry exists to teach users the concepts and protocols of hardware and software packages. The vendors themselves enjoy a significant revenue stream from education, as do many independent companies, schools and consulting organizations.

Because of the rising costs of conventional "stand-up" instructional methods, new kinds of interactive computer-assisted educational tools are emerging. The computer-mediated optical disk is currently the leading candidate for the most powerful machine-based educational medium.

The scoring range for this section is from 8 to 40, with anything more than a 25 implying leading-edge methods, and less than 15 implying no particular use of 1984-level methodologies.

User training and education

1. Automated "pilot" tools for course preparation ____
2. Computer-mediated video disk education facilities ____
3. Computer-aided instruction facilities ____
4. Planned education for users ____
5. Internal instructors ____
6. External instructors ____
7. User assistance group ____
8. Hot line for user technical questions or problems ____

Total ____

Technical information resources. Although major computing complexes exist in many enterprises to supply information, it is often surprising to see how narrow the definition of information actually is. Leading-edge organizations recognize that information consists of more than just financial reports and that to stay abreast of technology requires active pursuit of facts and trends from many sources.

The scoring range for this section is from 10 to 50, with more than 40 implying leading-edge methods.

Technical information resources

1. On-site technical library ____
2. Interlibrary loan service ____
3. On-line information service(s) ____
4. Keyword search capabilities for technical information ____
5. Corporate subscriptions to technical journals ____

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6. Corporate participation in copyright clearance center ____
7. Use of internal or commercial news and technical article clipping service ____
8. Access to city or university library facilities ____
9. Government publications services ____
10. Use of technical or management consultants ____

Total ____

Technology exploration. It is an unfortunate custom that in unfavorable economic situations, research is usually the first item to be cut. Research is often not recognized as an experimental discipline, with as many failures as successes. In fact, one of the key problems with getting technology exploration funded in many enterprises is the fact that corporate funding mechanisms often require proof of tangible benefits and some guarantee of success.

The difficulty of getting approved funding for research projects and the continuing threat of funding cutoffs if economic trends are negative lead to a curious phenomenon: hidden research projects and private exploration by individuals or groups of enthusiasts, sometimes in the face of official condemnation. The APL programming language, Visicorp's Visi Calc spreadsheet processor and Bell Labs' Unix operating system all emerged from personal research efforts, and two of the three had to overcome significant resistance before they became products.

The scoring range for this section is from 10 to 50, with more than 40 implying leading-edge methods and less than 20 implying no particular use of current methodologies.

Technology exploration

1. Small pilot projects ____
2. Corporate research funding ____
3. Local discretionary funds ____
4. Informal exploration by interested staff members ____
5. Formal exploration groups or departments ____
6. Conferences and trade shows ____
7. University or research groups ____
8. External consultants ____
9. Government sources ____
10. External research contracts ____

Total ____

Education of technical staff. It is not easy to keep up with the industry. New technical courses in volatile topics such as local-area networks may be a year or two out-of-date before they are even offered. One interesting method of keeping technical staff current (used for some years by research hospitals for medical professionals) is to set aside from $1,500 to $3,000 per technical employee per year for training and from 10 to 20 working days per year. With this allowance, the employee can select the courses, symposia or technical workshops he would like to attend.

The scoring range for this section is from 10 to 50, with more than 30 implying leading-edge methods and less than 15 implying no significant use of current methodologies.

Education of technical staff

1. Targets for number of education days per employee per year ____
2. Planned curriculum for technical staff ____
3. On-site education during working days ____
4. On-site education during evenings or weekends ____
5. Tuition reimbursement program for technical courses ____
6. Tuition reimbursement program for general courses ____
7. Academic leaves of absence for college studies ____
8. Internship program or summer hire program for colleges ____
9. Funds for external conferences and technical symposia ____
10. Funds for employee membership in technical associations ____

Total ____

Project library and control. In 1984, a typical medium to large enterprise will have 3,000 to 15,000 individual programs in production mode, which may total more than five million source lines. Extremely large multinationals can exceed 20,000 programs and more than 75 million source code statements. Even a small company can have more than 200 programs and systems and almost half a million lines of source code.

An enterprise's accumulated inventory of production systems is a valuable resource and should be well taken care of. And since changes to production systems occur frequently, some method should be used to protect master copies of source code and its accompanying documentation.

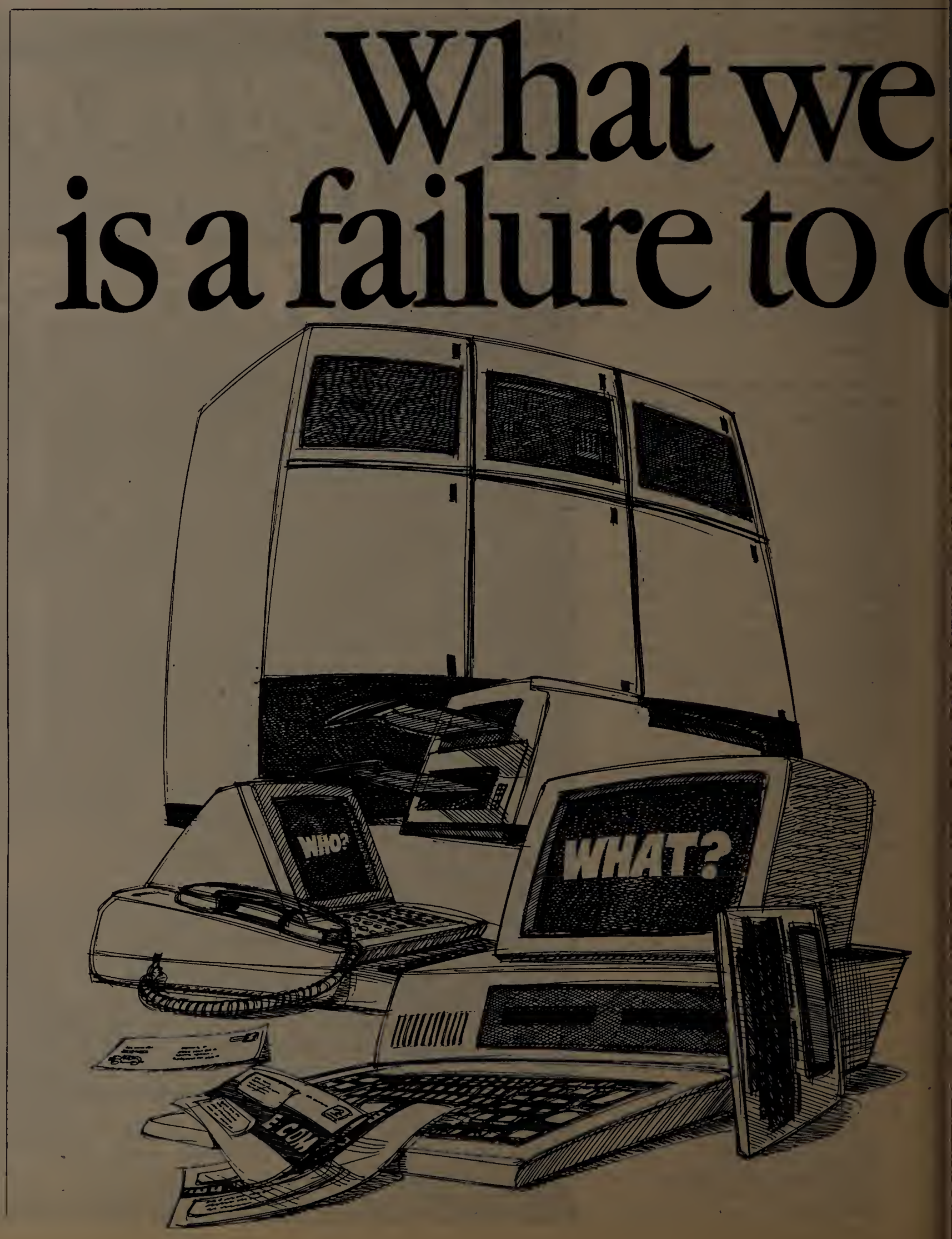
It is surprising that some enterprises are very casual about their production systems and have neither formal library control procedures nor library support tools.

A variety of good library packages is available from commercial software houses.

The scoring range for this section is from 10 to 50, with more than 30 implying leading-edge methods and less than 15 indicating no particular use of current methodologies.

Project library and control

1. Automated source code library ____
2. Automated update and patch control facility ____
3. Protected master copies of production systems ____
4. Reconstruction facility for back levels of systems ____
5. Multiversion library support facility for variations of common systems ____
6. Automated reusable code library ____



IN DEPTH/LEADING OR LAGGING?

7. Automated documentation library for user information ____
8. Automated graphics library ____
9. Automated test library ____
10. Program librarian function ____
    Total ____

Pretest defect removal. One of the painful discoveries of the 1970s was that testing by itself was not totally effective in getting rid of a high percentage of software bugs. In fact, all tests put together, from unit test through final test, would seldom find more than 75% of the bugs in a major piece of software.

Commercial software producers, such as IBM, were the first to make a science out of defect removal and to measure the costs and efficiencies of each kind of defect removal activity.

In 1984, most of the common kinds of defect removal activity have been studied enough to calibrate their costs and effectiveness, and some general rules of thumb can be stated.

For large systems, requirements and design problems are the most common source of error and the most difficult to eliminate through ordinary testing. Pretest design reviews, prototypes and formal design and code inspection are not only eliminating bugs in their own right, but upgrading the quality of the specifications so that it is easier to test effectively.

Government and defense software projects are starting to use a method called "independent verification and validation" or, in other words, getting another company involved in reviewing the contracted software and documentation to ensure, from a totally independent viewpoint, that the materials meet requirements.

In 1984, prototyping with an interpreted language (such as APL, Basic, Lisp) or prototyping with some kind of fourth-generation language or program generator (like Information Builders, Inc.'s Focus or Mathematica, Inc.'s Ramis) prior to starting mainline development is almost the norm, but not yet.

The scoring range for this section is from 10 to 50, with anything more than a 30 implying leading-edge methods.

Pretest defect removal

1. Prototyping of outputs, inputs and key functions ____
2. Design reviews or inspections ____
3. Formal quality assurance group ____
4. Quality circles ____
5. Independent verification and validation ____
6. Code reviews or inspections ____
7. Error-prone module analysis and prevention ____
8. On-line debugging tools ____
9. Documentation reviews or inspections ____
10. Automated fault reporting and analysis ____
    Total ____

Testing and test methodologies. Not only do organizations have inventories of thousands of production programs which may total millions of source lines, but those same enterprises may have created thousands of test cases over the years. The need for formal test methods, libraries of regression tests and, in some cases, test case generators is recognized as important in 1984, but only a minority of companies have acquired or built the tools and support to really professionalize testing.

The scoring range for this section is from 10 to 50, with anything more than a 30 implying leading-edge methods, and anything less than 15 indicating no particular usage of 1984-level methodologies.

Testing and test methodologies

1. Automated test library support ____
2. Automated test case generator ____
3. Unit testing ____
4. New function testing ____
5. Regression testing ____
6. Stress/performance testing ____
7. Human factors testing ____
8. User acceptance testing ____
9. On-site field testing ____
10. Commercial testing service ____
    Total ____

Maintenance and enhancement. The tools and methods that are effective in carrying out maintenance and enhancement work in 1984 are only a small subset of those that work for new development. However, several methods and a new kind of tool are starting to emerge as effective in the maintenance and enhancement area.

In large production systems, errors tend to clump in a small number of modules; typically, less than 5% of the modules will accumulate more than 50% of the total bugs in a system. If these "error-prone" modules can be identified and eliminated by cleaning them up or reprogramming them, the useful life of systems can be stretched significantly. Perhaps the most successful result of an error-prone module removal campaign was that carried out on IBM's IMS data base product in the early 1970s. It was discovered that 57% of the IMS bugs were found in only 7% of its modules, and their elimination resulted in more than a 40% reduction in overall maintenance.

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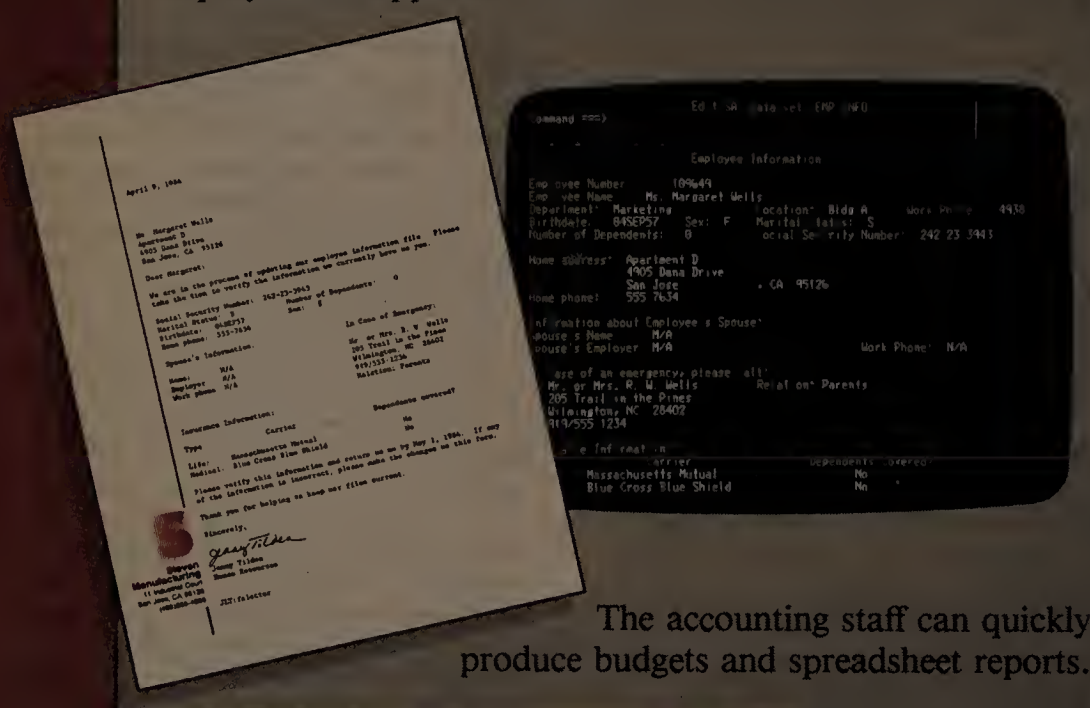

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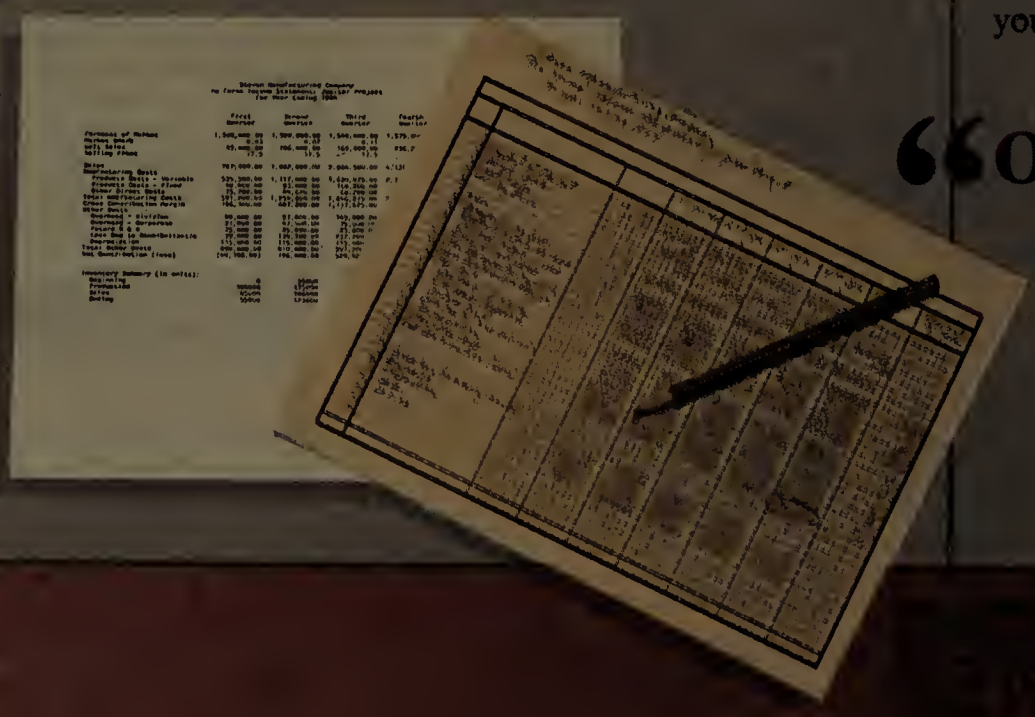

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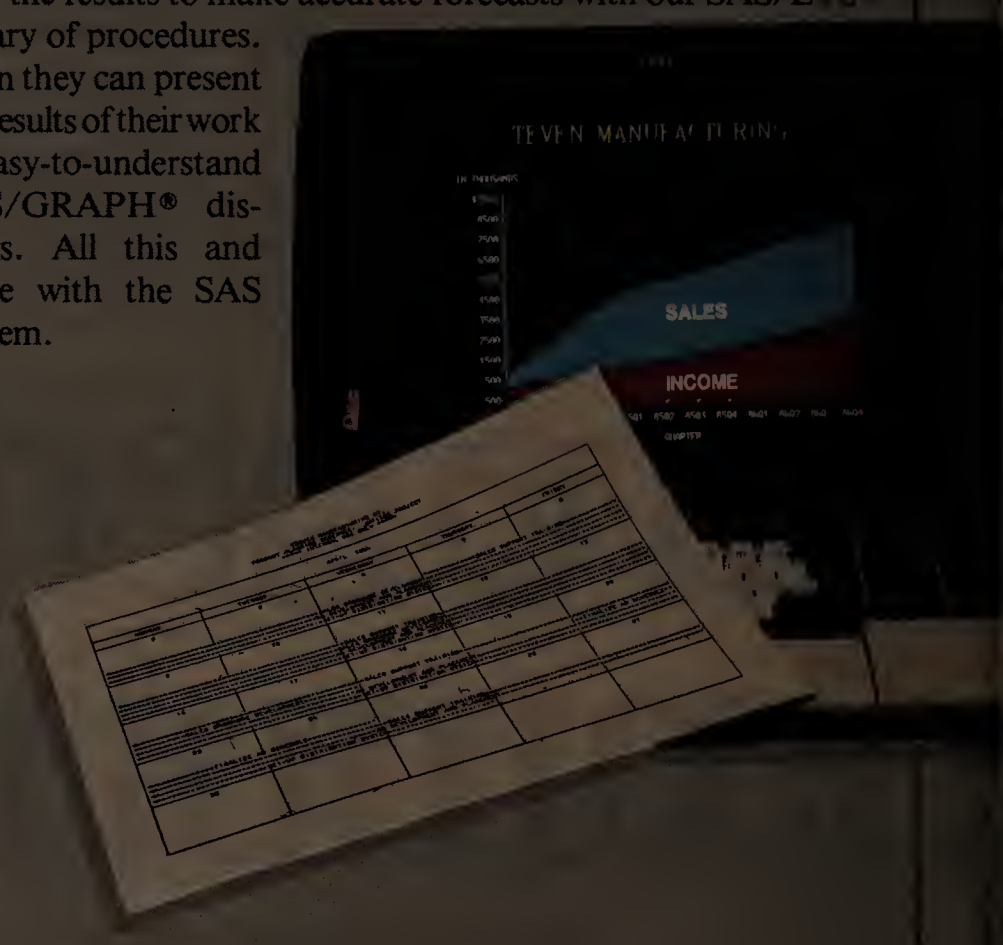

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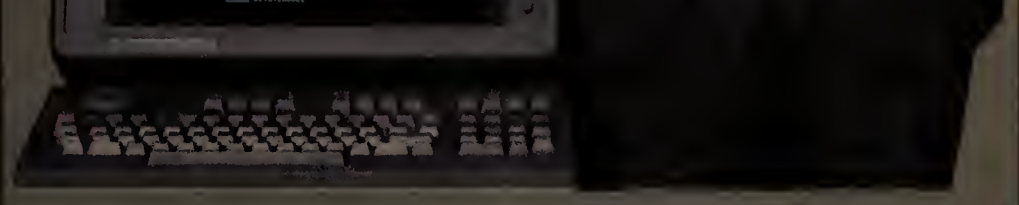
VSE SYSTEM USAGE BY DEPARTMENT
FOR APRIL 8, 1986

			CPU MINUTE		I/O COUNT	
DEPARTMENT	JOBNAME	NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
ACCOUNTING	JACC1110	3	31.32	10.44	11372	3791
	JACCT210	7	38.97	5.57	34968	4995
	JACCT220	8	103.95	12.99	74237	8280
	OTHERS	25	113.76	4.55	56085	2243
HUMAN RESOURCES	OTHERS	10	31.00	1.72	50314	2795
LEGAL	OTHERS	10	17.00	1.06	8218	514
MARKETING	JMKTG170	3	31.35	10.45	13557	4519
	JMKTG200	9	145.36	16.15	159131	17681
	JMKTG215	8	82.33	10.29	43748	5469
	JMKTG220	7	67.01	9.57	132357	18908
	OTHERS	21	89.85	4.28	100880	4804
PLANNING	OTHERS	17	43.00	2.53	27479	1618
PRODUCTION	JPROD200	12	80.47	6.71	107271	8939
	JPROD500	7	170.00	24.29	89020	12717
	JPROD650	4	58.35	14.58	91561	22890
	OTHERS	24	142.18	5.92	108352	4515
SYSTEMS	JSYS525	4	38.47	9.62	22518	5630
	JSYS620	4	24.62	8.15	39212	9803
	JSYS700	4	47.38	11.84	41780	10445
	JSYS850	4	48.67	12.42	40258	10064
	OTHERS	17	33.88	1.89	114281	8723
ALL JOBS		222	1440.00	6.49	1366608	6156



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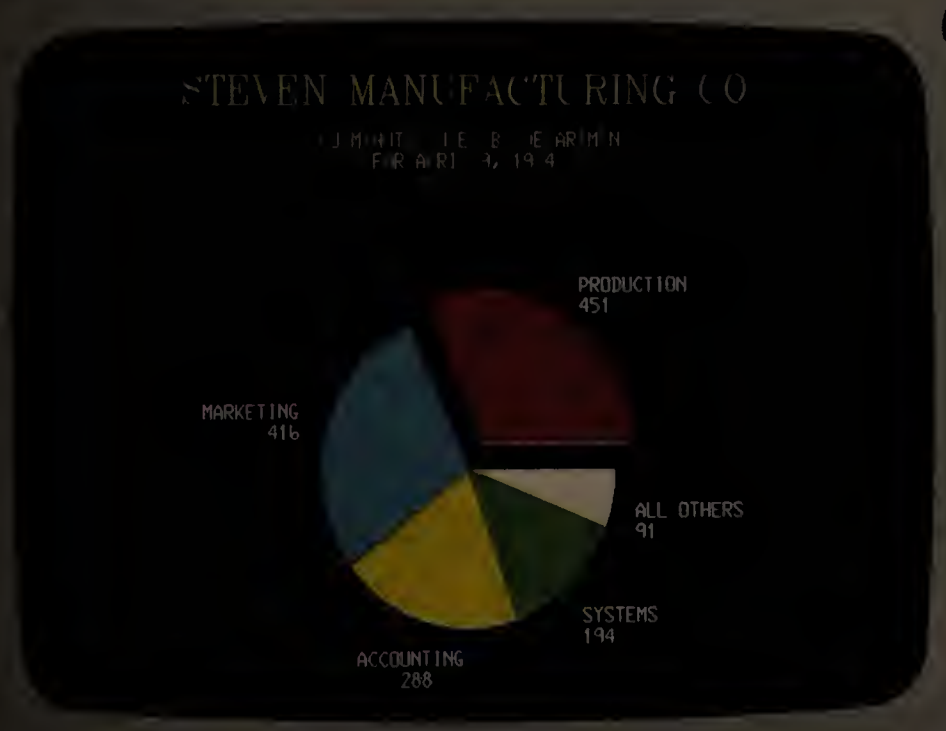

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nance is aimed at aging and unstructured systems whose documentation has long since become out of date. This new kind of tool analyzes the code and either partly automates its restructuring or helps human programmers to upgrade the code.

The scoring range for this section is from 10 to 50, with more than 30 implying leading-edge methods and less than 15 implying no particular use of 1984-level methodologies.

Maintenance, enhancement

1. Error-prone module analysis of production systems ____
2. Formal fault reporting for production systems ____
3. User satisfaction surveys for production systems ____
4. Training for maintenance personnel on production systems ____
5. Hot line support for quick responses to serious problems ____
6. Formal regression testing of all changes to production code ____
7. Updating system specifications and documentation for all changes ____
8. Conversion strategy and replacement schedule for aging or obsolete systems ____
9. Conversion tools for migrating obsolete systems ____
10. Code analysis tools for structural analysis of aging systems ____

Total ____

Communications across enterprise. A surprising finding in large multinational corporations that develop software in many cities and countries is that travel and hotel costs can be one of the top expense categories for new products. In one major system developed internationally by six different locations of a company, more than 3,000 trips were required over the 10-year development period, and the final costs for travel and hotels approached the total cost of the code itself.

In the U.S., the confusion resulting from the dismemberment of AT&T is causing both new opportunities and some major new headaches. The year 1984 will deserve to be remembered as the year that communication was elevated to significant levels. The director of communications or network director or director of telecommunications is starting to emerge as a major position with a great deal of responsibility and impact on enterprise operations.

Since managers and technical workers need to communicate often, a sign of a leading-edge enterprise is the care taken to make communications easy: voice mail, electronic mail and, in major cities, the acquisition of cellular modular telephone services for marketing and executive personnel.

The scoring range for this section is 15 to 75, with above 50 implying leading-edge methods and less than 25 implying no particular use of the current methodologies.

Communications across enterprise

1. Teleconferencing ____
2. Voice mail ____
3. Electronic mail ____
4. Automated distribution lists ____
5. Mainframe network ____
6. Local-area network ____
7. Telex service ____
8. Fax service ____
9. Cellular mobile telephones ____
10. Leased telephone lines ____
11. Alternate telephone services ____
12. Satellite transmission ____
13. Enterprise communications plan ____
14. Communications director ____
15. Courier service ____

Total ____

Security and disaster recovery. Only a few years ago, enterprises displayed their computer systems and data centers proudly, often in glass-front enclosures easily visible to passersby. Now, not only are major data centers usually in remote back areas behind badge-controlled doors, but a few enterprises have actually resorted to remote, off-site "hidden" data centers.

For disaster recovery, some commercial data centers offer backup and recovery services to their clients and can serve as secondary sites in case of fire or disaster at the client's primary data center.

With the widespread use of microcomputers at home and in the office, a new kind of physical security problem is emerging as micros begin to join electronic typewriters on the "most stolen objects" lists of metropolitan police departments.

Vendors are beginning to offer security devices for microcomputers such as locking steel base plates. The next generation of microcomputers will very likely have integral motion

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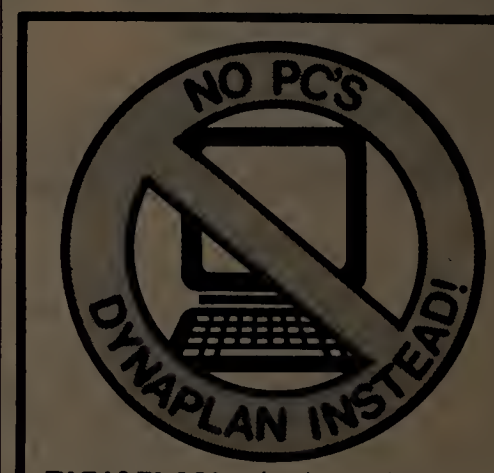

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IN DEPTH/LEADING OR LAGGING?

and fire alarms, as well as keyboard and terminal locks, to discourage theft, if not prevent it.

Although vital company records on micro floppy disks (and hard disks) are not intrinsically more insecure than the same records printed on paper, the security controls for microcomputer media have not been as tight. Companies are beginning to use color-coded disks and to purchase fireproof safes for disk storage, and some are setting up floppy-disk libraries in which both programs and data can be controlled.

The scoring range for this section is from 15 to 75, with more than 40 implying leading-edge methods and less than 20 indicating no significant use of 1984-level methodologies.

Security and disaster recovery

1. Formal disaster plans ____
2. Disaster "fire drills" ____
3. Backup computer systems and data retention sites ____
4. Halon fire systems in computer areas ____
5. Fireproof tape and disk vaults ____
6. Physical security controls on building access ____
7. System security monitors on production software and data ____
8. Use of data encryption ____
9. Locking plates or cabinets for personal computers ____
10. Fireproof safes for personal computer floppy disks ____
11. Controls on floppy disk data contents ____
12. Automated registration of personal computers ____
13. Automated registration of personal computer software ____
14. Security packages for portable computers ____
15. Radio frequency shielding of high-security computers ____

Total ____

Software personnel categories. Software is beginning to splinter into various specialties, just as engineering, medicine and other professions have. It is not uncommon to see linguists, psychologists and artists working in software and computing laboratories.

Modern, large enterprises are starting to recognize that software specialists in the areas of documentation, defect removal, network technologies, data base technologies and maintenance are valuable assets in addition to the general programming and analysis population.

The scoring range for this section is 23 to 115, with more than 70 implying leading-edge methods and less than 35 implying, in this case, either a small enterprise or one that is in generalist rather than specialist mode.

Software personnel categories

1. Application programmers ____
2. Application programmer/analysts ____
3. Systems analysts ____
4. Systems programmers ____
5. Chief programmers ____
6. Quality assurance personnel ____
7. Testing specialists ____
8. Maintenance specialists ____
9. Data base specialists ____
10. Documentation specialists ____
11. Graphics production specialists ____
12. Human factors specialists ____
13. Network specialists ____
14. Security specialists ____
15. Educational specialists ____
16. Planning specialists ____
17. Cost-estimating specialists ____
18. Standards specialists ____
19. Reliability specialists ____
20. Systems engineers/field support ____
21. Project librarians ____
22. Data entry support ____
23. Internal consultants ____

Total ____

Personnel policies and practices. Although U.S. corporations have been criticized recently as being the last feudal establishments and places devoid of democracy in an otherwise democratic country, it is only fair to point out that the direct and tangible benefits large corporations offer their employees usually considerably exceed those available elsewhere.

One of the most difficult business problems of the decade is to build a good benefits programs that meets employees' human needs without pricing the organization's products out of the world markets.

The scoring range for this section is 21 to 105, with more than 70 implying leading-edge benefits and personnel policies, and less than 35 indicating either a very small enterprise or one likely to have a high turnover rate among technical staff.

Personnel policies and practices

1. Opinion surveys ____
2. Dual compensation plan for professionals and management ____
3. "Open door" policy ____
4. Skip-level or executive interviews ____
5. Career planning and development ____
6. Formal appraisal program ____
7. Internal transfer program between corporate locations ____
8. Out-placement services for shutdowns and layoffs ____
9. Suggestion program and awards ____
10. Stock purchase plan ____
11. Quality control circles ____
12. Annual company-paid medical exams ____
13. Achievement awards program ____
14. Home buying and relocation program for employees ____
15. Pension plan ____
16. Medical and hospitalization plan ____
17. Dental plan ____
18. Corporate recreation program ____
19. On-site or corporate athletic facilities ____
20. Scholarship program ____
21. On-site child care facility ____

Total ____

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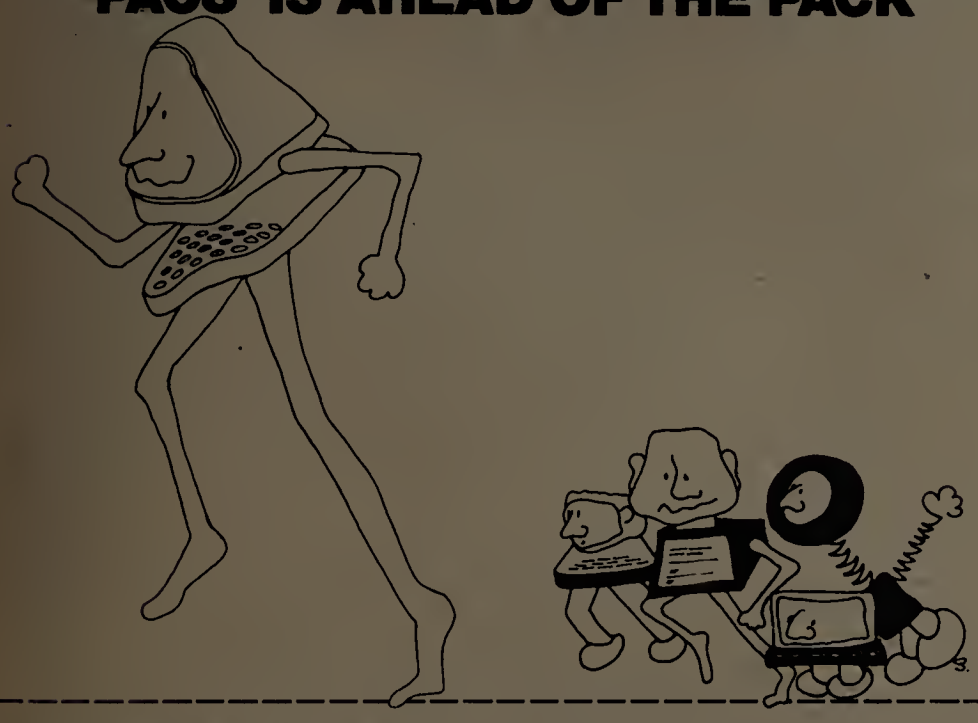

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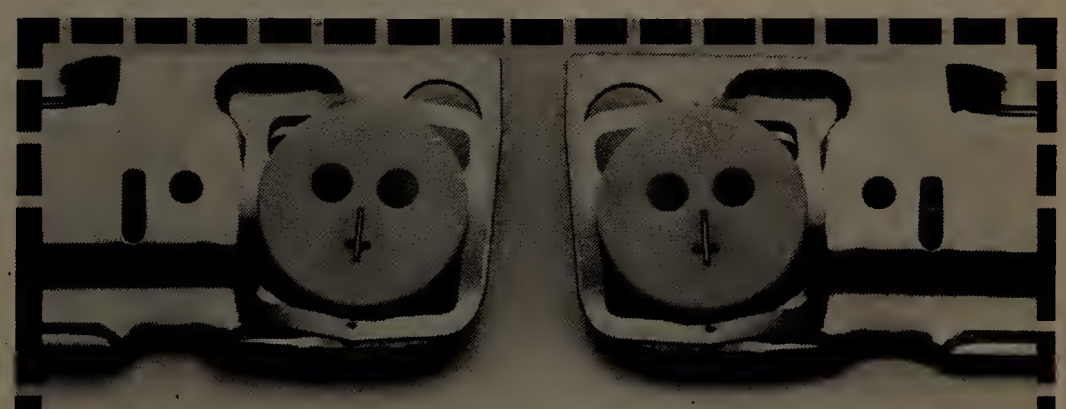

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IN DEPTH/LEADING OR LAGGING?

Emerging policies and practices. This section is a mixed bag of contemporary issues. For example, microcomputer technology is changing so rapidly that unless micros are depreciated on a two-year or three-year basis, there may be no easy way to get rid of them when better products are available, because their residual value is too high. The next issue is, how can a major corporation get rid of several hundred used microcomputers? Will there be a big market for used microcomputers of a previous generation? Can they be sold to employees at a discount? Will computer companies themselves buy them back or offer trade-ins? In short, what will happen to them?

Are you in a multinational company with overseas subsidiaries? Do you need a U.S. government export license to send one of your own proprietary software packages to your own subsidiary? It may be that you do.

When your programming and software employees buy home computers and establish sole proprietorships or corporations as a result, is this activity in conflict of interest with their daily work?

If your employees develop marketable software on their home computers, do they own the rights to it or does the parent company? Even if the parent company has an assignment of inventions clause in the employment contract, the results are not automatic because such clauses are illegal in four states (California, Minnesota, North Carolina and Washington) and may become illegal nationally under a proposed federal law, H.R. 3286.

Does your company have microcomputer users that share software packages informally with one another? What does this mean in terms of copyrights?

These are very modern problems, and about all that can be said in 1984 is that leading-edge companies are studying them carefully. A few, such as IBM, have made major changes in their internal personnel policies. For example, in order to encourage innovation and development of marketable Personal Computer software by its employees, IBM will pay a 15% royalty on Personal Computer software developed by employees.

Quite a few companies are depreciating microcomputers on a two- or three-year basis to get ready for the next generation. Many companies are encouraging employees to learn computing, either by giving discounts on home computer purchases or by loaning computers to key employees.

The scoring range for this section is 17 to 85, with more than 60 implying leading-edge awareness and less than 30 indicating either a small local enterprise or, if a large one, some potential excitement over the next few years.

Emerging policies and practices

1. Policy on protection of software copyrights for purchased packages ____
2. Policy on accelerated depreciation of personal computers ____
3. Policy on disposition of obsolete personal computers ____
4. Policy on employee discounts for personal computers ____
5. Policy on employee discounts for software packages ____
6. Policy on use of portable computers for business trips ____
7. Policy on home use of company-owned computers and terminals ____
8. Policy on telephone charges for home computing ____
9. Policy on insurance liability for work at home ____
10. Policy on ownership of software developed at home by employees ____
11. Policy on corporations owned by employees ____
12. Policy on U.S. export licenses for software used by multinational U.S.-based corporations ____
13. Policy on software warranties ____
14. Policy on data base access from personal computers ____
15. Policy on mainframe links from personal computers ____
16. Policy on personal computer purchases by end users ____
17. Policy on computer clubs and internal user groups ____

Total ____

Scorecard

Section	Scoring range Low	High
1. Planning/estimating/controls	18	90
2. Requirements and design	10	50
3. Purchased software evaluation	10	50
4. Code development	14	70
5. Data base design	15	75
6. Data center management	10	50
7. User documentation	15	75
8. User education	8	40
9. Technical information	10	50
10. Technology exploration	10	50
11. Education of staff	10	50
12. Project libraries	10	50
13. Pretest defect removal	10	50
14. Testing methodologies	10	50
15. Maintenance and enhancements	10	50
16. Communications	15	75
17. Security and disaster recovery	15	75
18. Personnel categories	23	115
19. Personnel policies	21	105
20. Emerging policies	17	85
Totals	**261**	**1,305**

About the author

Capers Jones is manager of the applications management practice at Nolan, Norton & Co. in Lexington, Mass. His background includes 12 years in large system development at IBM and four years as assistant director of programming technology at the ITT Programming Technology Center in Stratford, Conn.

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IN DEPTH

Protocol's conversion

The chance and change of going public

Substantial rewards await the company that goes public. The change in ownership status often brings new industry status in the eyes of users and corporate partners. Founders reap personal riches. Eleven months ago, Protocol Computers, Inc., maker of protocol converters, raised $14 million in the public marketplace. PCI President Richard L. Swarz describes here for Senior Editor George Harrar what happens when a company goes public.

What motivated you to go public last September?

I saw the need to reach a capital marketplace to ensure the stability and long-term growth of the company. With the capital resources that were available in the public marketplace, it was desirable to use this means of creating capital.

How much did you raise?

Fourteen million dollars. We anticipate that amount will serve us for 18 to 24 months. It may be shorter than that, but opportunities we see in the near future can be met with this amount of capital.

What was the money used for?

To maintain the ongoing working capital requirements and for financing long-term projects. It may fund some acquisitions that would add to our product line either in the purchase of technology or other companies.

What has happened to the stock price since your initial offer?

We are performing consistent with the high-tech group. When there was some decrease in pricing throughout the industry, our stock generally followed that pattern.

Is it slightly up now? It was about 12 at the initial offering.

Stock price is something you must watch closely, now that the market's perception of the company is much more important.

It's an obligation to manage our company with responsibility to our shareholders. I don't think we did many things differently when we were private. The view toward a profitable business, of maintaining the mid-term, short-term and long-term goals of the company to have a continued presence, a continued leadership presence in the market, hasn't changed. What we have, though, is a different opportunity to communicate about the company. Now we feel there's a

stronger obligation to talk about the company, its current results and future plans and to present the company in a form that is nontechnical.

That takes a long time and costs extra dollars in travel, bookkeeping and filing paperwork with the FCC.

Most of our clients are publicly held companies that understand the reporting requirements, the obligations of a publicly held company in the American business community. To reach that public status and to have the same set of rules by which we're judged and governed is an important credibility issue and was an objective for me.

Do clients respond better to you as a public company? Is that what you're saying?

Overall, it has had a very positive impact on the company and our ability to address markets and clients who have to be concerned about the stability and the resources of their suppliers.

Can you point to a sale that you made after becoming a public company in which that was an influence?

There were occasions when the fact that we had this credibility, this resource, and we did follow that public set of rules, was a help in getting us contracts.

How about your deal with Ungermann-Bass, Inc.? Would that have been possible if you were still a privately held company?

The opportunities to be successful bring with them immense concerns about continuing success. We were very fortunate to provide and find a market niche that had margins to give us positive cash flow.

That would have been possible. I don't know that it would have come about as quickly or as easily if they were concerned at all about our ability to be a long-term supplier to them. The relationship now is beginning, and we plan to transport our current protocol products to their units. It is also an understanding that we will participate in solving protocol problems for their clientele in the future. There is a sense that this is just the dawn of a relationship. And clearly, they would be concerned if we were not strong and healthy and viable.

I'd like you to describe your latest product and what you think it can do for your company in terms of growth.

Let me set it in the environment that we saw. The IBM 3270 communications environment is superb. It has some apparent limitations in our view because the products were dedicated to communicating only with IBM computer systems. We invented a product to give the same existing 3270 terminals the ability to communicate with the non-IBM world.

We expanded the utilization of one terminal that already existed or could be acquired to be much more functional to provide a broader opportunity for the user. They can now dial out and reach Dow Jones and the Source. They can connect to local-area networks. They can be used as terminals to multiuser computer systems. They can transfer or receive electronic mail from networks that are not connected through the IBM world. It broadened the opportunity for the use of an existing product. And that's the 74D. It's a deconversion product. It's the reverse of making the 3270 world IBM compatible — you make the IBM terminal work with the world.

What are your gross revenues?

We closed 1983 with $11.2 million, and we expect to do substantially better in 1984.

What could happen out there that you've thought about, considered, perhaps planned against that could negatively affect your company?

We're concerned with our own abilities to manage our company. We're concerned with the potential of our industry to bring a product of quality to market and maintaining that quality. We're concerned about commodity vendors moving into some segments of the marketplace and making it solely a price issue when it should be driven by quality.

Are your competitors generally publicly held companies?

The distinguishing factor is that we are the only protocol conversion company devoted to that technology that is public. There are other companies that have acquired the technology by acquiring companies.

Is going public inevitable for a company such as yours?

The opportunities to be successful bring with them immense concerns about continuing success. We were very fortunate to provide and find a market niche that had margins to give us positive cash flow. As the marketplace becomes more popular and competitive, the cash flow requirements become much more important. You need to reach capital marketplaces, and there are very few available opportunities. You either have venture capital, debt as the second possibility or the public marketplace. We were fortunate to reach the capital marketplace.

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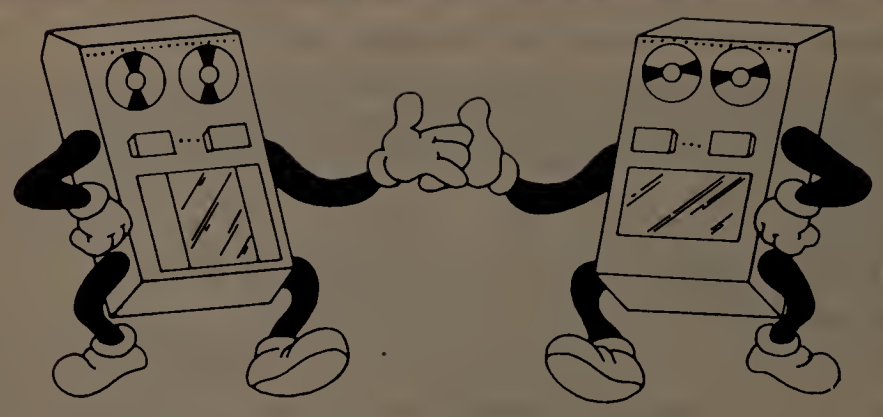

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XEROX

Xerox nets IBM.

If you have a number of IBM personal computers, you probably wish they could link into an office system instead of just stand alone. Now they can, on the Xerox Ethernet Network System.

Hook your IBM PC's into Ethernet and they'll be able to access twenty different Xerox machines and the vast number of our network services. And they'll be able to communicate with other machines—whether they're in your office or in another country.

In fact, Xerox has installed over 800 Ethernet systems throughout the world. And we've become known as the international standard in baseband networks.

It's no wonder. No other communications network offers you as many options as the Xerox Network System. Your IBM PC's can share information with other PC's as well as our 16/8 Personal Computer, our 860 Word Processor and especially our 8010 Star Professional Workstation. Then there are our file servers, for organizing and storing data. Our communications servers, for reaching into your mini computer or mainframe, anywhere in the world. And our laser printers, for the highest quality output available today.

And as your business grows there's no limit to how large your system can grow.

The Ethernet Communications Network can also put you in touch with Team Xerox—a wide array of products, people and services designed to meet your information needs.

TeamXerox

So call your local Xerox Office Systems sales representative. Because why should you wait a few years for you know who to come out with their network services when you can have the best now?

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IBM and IBM PC are registered trademarks of International Business Machines Corporation.

The personal rewards were marvelous. But more it's the joy, the pride and just the sheer pleasure of seeing a concept grow into a product and then to market the resulting products. It is one of the joyful things of life.

Who are the major stockholders now? I assume you retain . . .

I still have the majority interest in the company.

What percentage would that be?

Over 50%.

Prior to going public, what positions did you hold?

I was and still am chairman, president and chief executive officer. We have a superb team, and we're adding other strong team members. We see the expansion from all levels within the company, including the executive level. One of the most significant additions to our team in the summer of 1983 was that of vice-president and chief financial officer. He has brought a knowledge of being a public company and of the organization that we require to achieve success at the next level of growth.

What are the disadvantages of going public?

I went to law school in the evenings and passed the bar. It was more difficult than that, or at least as difficult as passing the bar. But the objectives were within my control then; reaching of the public marketplace for the most part is beyond your control.

Was there any doubt along the way? Did you have any of those times once you started on the path to going public where things didn't look very good?

I have confidence in the overall strength of the company, its underwriters and the perception of the path within the marketplace that would achieve public status. To say that there weren't moments of concern wouldn't be appropriate. But I was always confident we would become public.

What is your growth rate now? For 1983, I saw a figure of 300%.

I don't think we're going to get 300% this year, but we're going to grow substantially.

You're not going to specify a figure?

That's right. You make a conscious decision whether you're going to give projections; and in this environment, you have to be careful. It's like forecasts in a political campaign, where you're always measured according to expectations rather than actual performance. I'm sure we have very optimistic views of our future. But we have made a conscious decision not to provide projections. It is the nature of the small, soon-to-be-large high-tech companies that they do grow and that they either pick a segment of the marketplace that is growing or create a marketplace that grows.

We consider that we're pioneers, that we have, in fact, created a marketplace for our products. We have taken the energy and made the investment to educate the market on what protocol conversion might do for them.

You have taken the spotlight in terms of meeting the clients, the analysts in New York, the press. You have become much more of a public person. Is that a role you like, being the image of the company? Is it taking you away from developing protocol converters?

Clearly the management of my involvement with the company vs. presenting the company is something I watch very carefully.

In most cases, it's a very interesting experience. The analysts are bright, articulate, probing individuals who come to the table with questions that we as a company should address.

Did you have to reassess the company in terms of efficiency and the kind of personnel you've had. Is that all a part of going public — you take a closer look at yourself because you're being scrutinized by outsiders?

We saw one department created that should have been created; we added the financial arm of the company.

Going public was clearly the incentive to make sure that this department was well staffed. The results and information we're getting from that department give us the ability to manage better.

Is it possible to put a price tag on going public?

Oh, definitely. The total sum was in excess of $400,000.

What did that sum include?

There are fees to the underwriter, the publishers, attorneys, travel and other expenses.

Would you say it was a far more difficult process than you anticipated?

Not more difficult than we anticipated; we maintained confidence in our own abilities and the company. It's a very exciting time; the last moments are as exciting as the first moments.

How did you celebrate after the initial offering was made?

We gathered our company together, we opened some champagne, we said thank you to each other. It was a very emotional and warm moment, and we determined to make this the greatest company ever.

No computer should be an island.

Standalone computers have clear limitations, but when they're linked to a data network they can give and receive information from many sources. That's why Boeing Computer Services offers you an independent, end-to-end, fully managed networking capability. And that's how you can take advantage of our expertise to connect your existing equipment and systems.

Boeing provides total system engineering and integration capability, selecting the best hardware and software technology without bias toward any particular manufacturer. The key word is "flexibility." We want to make sure that our network solutions can support the additional modifications you're sure to make in the future.

Our expertise was forged by years of experience with our own System Network Architecture (SNA) capability. Our customers can interconnect any existing SNA network to the Boeing network for added transmission capability. Or simply use the Boeing network for all data communications.

We're also experienced with the X.25 distributed processing architecture. For the state of Pennsylvania, we were selected to link numerous totally independent agency networks into a single network via X.25 protocols.

In addition to data, we can provide voice, video and fax communications. All part of Boeing's complete integrated information services. Including enhanced remote computing services. Distributed processing and micro/mainframe links. Office information systems. Software solutions. Education and training. And a variety of professional support services. So start building bridges. For more information or the location of the sales office nearest you, call **1-800-447-4700**. Or write BOEING COMPUTER SERVICES, M.S. CV-26-15B, 7980 Gallows Court, Vienna, VA 22180.

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MICROCOMPUTERS

Compaq claims No. 2 spot in 16-bit mart; sees IBM compatibility key to growth

LAS VEGAS — Compaq Computer Corp. shipped more than 32,000 microcomputers during the quarter ended June 30 and has become the world's second-largest supplier of 16-bit personal computers, Compaq President Rod Canion said during an interview here last month.

Canion

Compaq's claim to the No. 2 spot "surprised a lot of people," Canion acknowledged. "Certainly, if you look just at the IBM-compatible makers, Compaq's the No. 1 supplier, but that's really a much less important measure to us now."

The Houston-based manufacturer posted $62.9 million sales in the quarter ended March 31 and currently employs about 950 people, Canion noted. Compaq reported $111.2 million in sales during 1983, the company's first year of operation.

Canion maintained that Compaq's new Intel Corp. 8086-based Deskpro series, introduced June 28, runs software much more quickly than an IBM Personal Computer and is as compatible with the Personal Computer standard as the company's original transportable models. "We think the market has made a clear statement that full compatibility is required," he said.

"IBM has not shown either the ability or the intent to be as compatible with its family as we are," Canion said. He stated that all Compaq machines run all IBM Personal Computer software, but "the [IBM Personal Computer XT] doesn't run all the [Personal Computer] software. The PCjr doesn't run a large percentage of the [Personal Computer] software. And there's a significant amount of software that even [IBM's] portable doesn't run."

Canion said that the AT&T Personal Computer, also built around an 8086 processor rather than the IBM system's Intel 8088 chip, is billed as compatible, but operates only at 8 MHz and is unable to run software designed for the IBM machine's 4.8 MHz clock speed.

"There's a set of software that won't run at high-speed mode, so we have a low-speed mode that picks up all the rest of that," he said. "You can argue all day long that that's a minor difference. But you can pick out minor differences throughout the history of the market, and they're important to certain sets of people." The Deskpro's speed, tape backup and modular storage expansion capabilities will appeal to other sets of people, according to Canion.

He noted talk that the rumored IBM desktop system based on the Intel 80286 chip might affect Compaq, but said, "It's really hard to compare a phantom product." He added that when IBM prepared to unveil its Portable Personal Computer, "people imagined all sorts of terrible things happening, and in fact there was no impact."

IBM and Compaq systems currently are priced at similar levels, Canion pointed out. "If it's an 80286 machine with all sorts of new capability, you would expect it to be positioned higher, so then it becomes a matter of features vs. price." He added, "We're not entering a new market-

See **CANION** page 66

TI announces expert system software tool

AUSTIN, Texas — Texas Instruments, Inc. has announced an expert system development package that allows software developers to design and deliver expert systems on the TI Professional.

TI's new Personal Consultant development package contains all the features necessary for a designer to prototype and develop sophisticated commercial applications that would be difficult and costly using conventional programming techniques, according to the company. The development tools reportedly will be available in the fourth quarter of the year.

Developers using Personal Consultant software can create an expert system incorporating up to 400 production rules on the Professional, the company said. (Production rules are said to specify actions or steps taken by the program in a given situation.) Larger expert systems, developed on higher capacity computer systems, also can be adapted to run on the Professional, according to TI.

Personal Consultant software interacts with end users through a question-and-answer dialogue, the company said. The system reportedly employs a window-oriented, cursor-controlled selection technique that allows users to pick from a list of alternatives.

Applications can handle uncertain or imprecise data by including certainty factors, permitting the system to determine and state the degree of confidence for a

See **TI** page 66

INSIDE

Software/**61**

Micro-mainframe link options growing

MICRO BITS
Thomas W. Madron

When Radio Shack Corp. announced its bisynchronous IBM 3270 and 3780 software emulators in 1981, a number of commentators claimed there was little or no market for such products.

An early manufacturer of a bisynchronous emulator for the TRS-80 Model II, Bob Snapp of Snapp, Inc., was quoted as saying, "The market for these IBM products is quite limited." Snapp's judgment was ultimately wrong, considering the number of such products now available for machines running Microsoft Corp.'s MS-DOS.

In 1981, the issue was twofold. Radio Shack was ahead of the market, in that insufficient numbers of micros were deployed in large organizations. Also, the company chose the wrong approach to 3270 emulation, although its current products seem to have remedied the situation.

One method for emulating IBM 3270-type communications is to use a protocol converter that allows multiple dumb Ascii terminals to be connected. The protocol converter most frequently appears to the IBM mainframe as an IBM 3274 cluster controller and is attached through a bisynchronous or a Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) port on the front-end processor.

If the organization has major systems from different vendors, the protocol conversion solution may allow a single micro to communicate with all systems over an appropriate network and use all the full screen functions of all or most host systems.

In particular institutional environments, it may be necessary to use IBM-specific communications: 3270-type transactional terminal systems or 3780 remote job entry (RJE) terminals.

Synchronous communications is further complicated by the use of two different IBM synchronous protocols, bisynchronous and SNA/SDLC, which are not compatible with one another.

With 3270-type communications, the 3270 terminal must be plugged into a cluster controller that handles up to 32 terminals. Although large numbers of older models are still in use, there currently are two primary types of cluster controllers, the 3274 and the 3276.

A 3274 can function as either a local or a remote controller, meaning that it is

See **LINKS** page 62

Madron is manager of computer services at North Texas State University, Denton, Texas.

Microcom offers Macintosh modem

NORWOOD, Mass. — A 1,200 bit/sec intelligent modem and communications software package for the Apple Computer, Inc. Macintosh computer has been introduced by Microcom, Inc.

The direct-connect modem, dubbed Macmodem, reportedly supports autodial and autoanswer functions and is AT&T 212A-compatible. The device also reportedly can transmit at 0-300 bit/sec and can be upgraded to 2,400 bit/sec. Macmodem's other features are said to include tone and pulse dialing, a speaker to monitor calls, unattended operation and front-panel LED status indicators.

Macmodem reportedly allows users to store telephone numbers, communications parameters and logon sequences and to dial using the Macintosh mouse. To dial, users place the mouse beside a displayed telephone number, point the mouse and click its button, and the logon sequences and passwords are sent automatically, the vendor said.

Macmodem is also said to be capable of supporting the Microcom Networking Protocol (MNP) for communications with other MNP-equipped systems. The device can exchange any Macintosh file with other Macintosh computers, IBM Personal Computers and PCjrs and Apple IIes and IIIs, Microcom said.

Macmodem is priced at $699.

Microcom is located at 1400A Providence Highway, Norwood, Mass. 02062.

Sharp enhances PC-5000 portable

PARK RIDGE, N.J. — Sharp Electronics Corp. has introduced a memory expansion cartridge for its PC-5000 portable computer and a software package to allow the PC-5000 to emulate a Digital Equipment Corp. VT102 terminal. The company has also announced a letter-size plotter, with a suggested list price of $399.

Sharp's CE-103M, 128K-byte memory expansion cartridges reportedly can be added to the 64K-byte memory expansion cartridge already available for the PC-5000 to provide memory of 320K bytes.

The EM100 software is said to convert the PC-5000 into a VT102 terminal for use with DEC mini or mainframe computer systems, or others using protocol converters.

The EM100 requires 128K bytes of memory and Version 2 of Microsoft Corp.'s MS-DOS and offers 24 line by 132 column buffered display, Sharp said.

The CE-515P four-color letter-size plotter reportedly may be connected directly to an IBM Personal Computer and compatible models. It accepts paper up to 8½ in. wide and reportedly can plot on postcard-size documents.

The CE-103M is priced at $295. The EM100 software is priced at $199.

Sharp Electronics is located at 10 Sharp Plaza, Paramus, N.J. 07562.

Telephone link out for Macintosh

NORTH HOLLYWOOD, Calif. — Intermatrix has introduced Macphone, a telephone handset and software combination that reportedly interfaces with Apple Computer, Inc.'s Macintosh computer and stores and dials up to 200 names and telephone numbers.

Macphone offers Touch-Tone compatibility with long-distance telephone services; a built-in, three-month calendar; and automatic logging capability for phone calls, Intermatrix said.

The logging capability reportedly can list the name of each person called, the starting and ending time of the call, the date the call was placed and its cost and then compute consultation charges based on the call's duration.

According to the company, Macphone also is said to offer a notepad facility, with notes automatically filed in the phone log. An electronic memo pad, also included in the package, reportedly is compatible with the computer's Macwrite software and allows users to record longer notes or memos.

Macphone is priced at $199.95, including the telephone handset and base, software, operator's manual, connecting cords and plugs, the company said.

Intermatrix is located at 5547 Satsuma Ave., North Hollywood, Calif. 91601.

Unix V-based supermicros out from Cromemco

MOUNTAIN VIEW, Calif. — Cromemco, Inc. has unveiled two supermicros, the System 100 and the System 300, both based on AT&T's Unix.

Built around Motorola, Inc.'s 68000 microprocessor, the systems run under AT&T's Unix System V with University of California at Berkeley enhancements.

The systems also can use the firm's Cromix operating system. Both systems are available in four standard configurations, each of which can support up to 16 users, Cromemco said.

Eight-slot unit

The System 100 reportedly is an eight-slot unit available in standard models featuring between 512K bytes and 2M bytes of random-access memory (RAM), 390K bytes of floppy disk storage and 50M bytes of hard disk storage. RAM can be expanded to 4M bytes, the vendor noted.

Two standard 512K-byte configurations, with two open backplane slots, are available either with or without error-correcting-code (ECC) RAM.

The configuration without ECC costs $9,995; the configuration with ECC is priced at $10,495. A 1M-byte configuration with ECC and one open backplane slot costs $12,695. A 2M-byte version with two open slots and ECC costs $16,995.

The System 300 is said to be available in basically the same configurations as the System 100, but with more floppy disk storage and 20 card slots.

The System 300 can be expanded to offer 16M bytes of RAM, the vendor said. Each System 300 model features floppy disk storage capacity of 1.2M bytes, the company said.

A 512K-byte configuration without ECC RAM and with 14 open slots costs $12,995. With ECC memory, the unit costs $13,495. A 1M-byte version with ECC and 13 available slots is priced at $15,695, while a 2M-byte configuration with 14 slots and ECC costs $19,995.

Cromemco can be reached at P.O. Box 7400, 280 Bernardo Ave., Mountain View, Calif. 94039.

IBM micro data base service bows

CAMBRIDGE, Mass. — A monthly service called Datadisk has been established by Cambridge Planning and Analytics, Inc. The service provides diskettes containing an economic data base and software for its analysis and presentation.

The service reportedly will provide IBM Personal Computer users with data on such measures of the U.S. economy as sales, financial conditions, production, orders and inventories in major industries, income trends and labor developments.

The data base is updated monthly and includes 36-month forecasts and historical data dating back to 1948.

The Datadisk service frees the user from the requirement to download a data base from a mainframe computer. Datadisk reportedly contains programs for the management of economic data bases, processing the data, interaction with other programs and generation of graphs and tables.

The software runs on any IBM Personal Computer or compatible model with 128K bytes of memory, color/graphics board and printer.

Datadisk is priced at $795 for a full year or $270 for the program and $60 per month for the data update service.

More information is available from Cambridge Planning and Analytics, 55 Wheeler St., Cambridge, Mass. 02138.

SOFTWARE

LIFETREE SOFTWARE, INC.
Volkswriter Deluxe offerings

Lifetree Software, Inc. has announced that it will offer its Volkswriter Deluxe word processing software for the Texas Instruments, Inc. Professional, Tandy Corp. 2000 and Hewlett-Packard Co. 150 personal computers.

Volkswriter Deluxe reportedly offers text merge as standard, a feature which allows users to create mass mailings.

It also is said to rely on function keys rather than control keys for the execution of commands and to offer proportional spacing and micro-justification. It also can import data from spreadsheet programs.

Volkswriter Deluxe costs $295, the vendor said.

Lifetree Software, 411 Pacific St., Monterey, Calif. 93940.

SOFTCRAFT, INC.
Xtrieve

Softcraft, Inc. has announced a data base management product for building data base queries.

Xtrieve, developed for the IBM Personal Computer, is a menu-driven data dictionary that provides a virtual table interface to data files that allows users to retrieve information from the data base.

Xtrieve is available in a local-area network version, allowing multiple workstations to access the same files simultaneously.

It is available for Orchid Technology, Inc.'s PCnet; Davong Systems, Inc.'s Multilink; Corvus Systems, Inc.'s Omninet; 3Com Corp.'s Etherseries; and Novell Data Systems, Inc.'s Netware networks.

Xtrieve is based on Softcraft's Btrieve, a file management and record retrieval system that uses the B-tree file management structure, the vendor said.

Xtrieve also provides interfaces that allow it to transfer information between Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase II, according to the vendor.

The price of Xtrieve is $195, and it will be available in September.

Softcraft, P.O. Box 9802, #590, Austin, Texas 78766.

APPLE COMPUTER, INC.
Enhanced Apple Writer II version

Apple Computer, Inc. has introduced an enhanced version of the Apple II word processing software for use on its Apple IIe and Apple IIc personal computers.

Based on the company's Prodos operating system, Version 2.0 of Apple Writer II works with Apple's Profile hard disk and Quark, Inc.'s Catalyst IIe, a program selector that allows all Apple IIe programs to be stored on a hard disk.

The selector also lets users move from application to application without having to restart the computer each time a program is switched. The new program reportedly also has a built-in Catalyst IIe file for installation of the program onto the Profile.

In addition to horizontal scrolling and a text display that gives users a page and line count, the software has a built-in terminal mode that gives users access to information services from within the Apple Writer. A utility reportedly lets users who lack a Prodos user's diskette to format a blank disk.

The program sells for $149. Until next Feb. 1, Apple IIe users can upgrade their software by sending master disks, manual cover and $50 to Apple Writer II Upgrade, P.O. Box 306, Half Moon Bay, Calif. 94019.

Apple Computer, 20525 Mariani Ave., Cupertino, Calif. 95014.

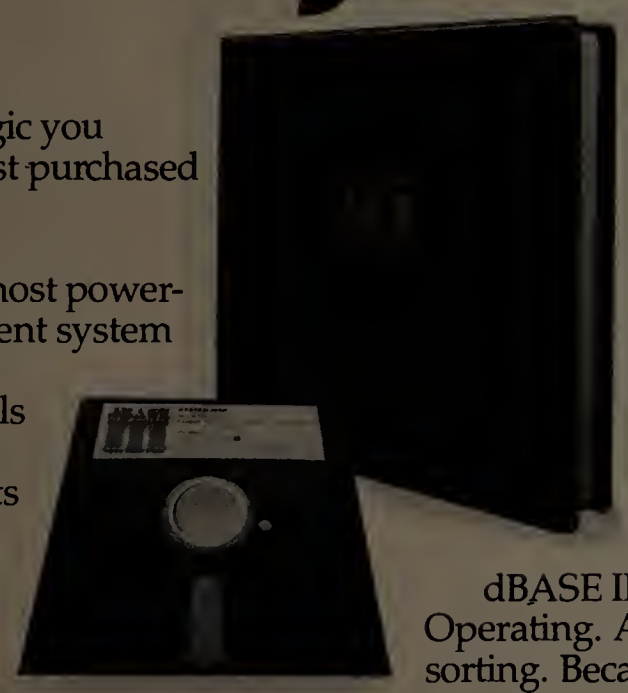
SEI ENTERPRISES, INC.
Cryptdata

SEI Enterprises, Inc. has announced a disk security system for disks and communication networks.

Designed for the IBM Personal Computer and PCjr, Eagle Computer, Inc.'s Personal Computer and the Eagle 1600 systems, Cryptdata is a two-

Continued on page 62

More power to you.



Remember the magic you expected when you first purchased a PC?

It's here.

dBASE III™ is the most powerful database management system ever created for 16-bit microcomputers. It pulls every ounce of energy out of your PC and puts it to work.

On top of that, it's fast and it's easy.

You've never seen anything like it.

dBASE III can handle over a billion records per file, limited only by your computer system. You can have up to ten files open, for sophisticated applications programs.

When you have two related files, information in one can be accessed based upon data in the other.

dBASE III now handles procedures, parameter passing and automatic variables. You can include up to 32 procedures in a single file. With lightning speed. Because once a file is opened, it stays open. And procedures are accessed directly.

Easier than ever.

dBASE III uses powerful yet simple commands that are the next best thing to speaking English.

If you're unsure of a command, HELP will tell you what to ask for.

If you don't know what command comes next, a command assistant does. All you have to know is what you want it to do.

Our new tutorial/manual will have you entering and viewing data in minutes rather than reading for hours.

And to make matters easier, you get a full screen report setup for simple information access.

Faster than no time at all.

dBASE III isn't just fast. It's ultra-fast. Operating. And sorting. Even faster, is no sorting. Because dBASE III keeps your records in order, so you really don't have to sort anything. Unless you want to. Then watch out!

What about dBASE II®?

It's still the world's best database management system for 8-bit computers. And it's still the industry standard for accounting, educational, scientific, financial, business and personal applications.

Tap into our power.

For the name of your nearest authorized dBASE III dealer, contact Ashton-Tate, 10150 West Jefferson Boulevard, Culver City, CA 90230. (800) 437-4329, ext. 333. In Colorado, (303) 799-4900.

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MICROCOMPUTERS

Continued from page 61
program coding and decoding system that provides security capability for communication networks or phone lines.

Price for the two-program package is $99.95.

SEI Enterprises, 17 Serpi Road, Highland Mills, N.Y. 10930.

BUSINESS MODEL SYSTEMS, INC.
Business Modeler for IBM Personal Computer XT

Business Model Systems, Inc. has made its Business Modeler software available for the IBM Personal Computer XT.

The software reportedly allows the XT to act as a stand-alone modeling system or to be integrated into a network with other IBM computers, including those housing the corporate data base.

Users of the Business Modeler on large systems reportedly can input and process some of their tasks on the micro systems. The Business Modeler uses a Cobol compiler and assembler language functions.

Business Modeler is priced at $795 for a nine-table version and at $1,950 for a version holding 1,999 tables.

Business Model Systems, 2625 Butterfield Road, Oak Brook, Ill. 60521.

FOX RESEARCH, INC.
10-Base

Fox Research, Inc. has introduced a version of its 10-Base data base management system for its 10-Net local-area network system.

Based on the SQL language developed for IBM mainframes, the original 10-Base runs under either IBM's PC-DOS 2.0 or Microsoft Corp.'s MS-DOS 2.0 operating systems and requires 192K bytes of memory, a cursor-addressable monitor and at least one disk drive, according to Fox.

The 10-Base version for Fox's 10-Net reportedly permits single-query access to multiple files without restricting the number of files that can be created.

The network version of 10-Base is priced at $895.

Fox Research, 7005 Corporate Way, Dayton, Ohio 45459.

PEARLSOFT, INC.
Pearl Fileload

Pearlsoft, Inc. has introduced Pearl Fileload, a software utility that reportedly allows IBM Personal Computer users to import files from Lotus Development Corp.'s 1-2-3 and from other data bases to the Pearl relational data base management system.

Pearl Fileload also reportedly copies reports generated by the data base management system, Personal Pearl, into data files and lets users generate queries based on data from multiple files.

Pearl Fileload can import files from any application that generates Ascii format data, according to the vendor. The package also is said to allow text created by Micropro International Corp.'s Wordstar and other word processors to be worked into reports and data to be downloaded from many accounting packages.

Pearl Fileload is priced at $100, the vendor said.

Pearlsoft, 25195 S.W. Parkway, Wilsonville, Ore. 97070.

See **TOOLS** page 66

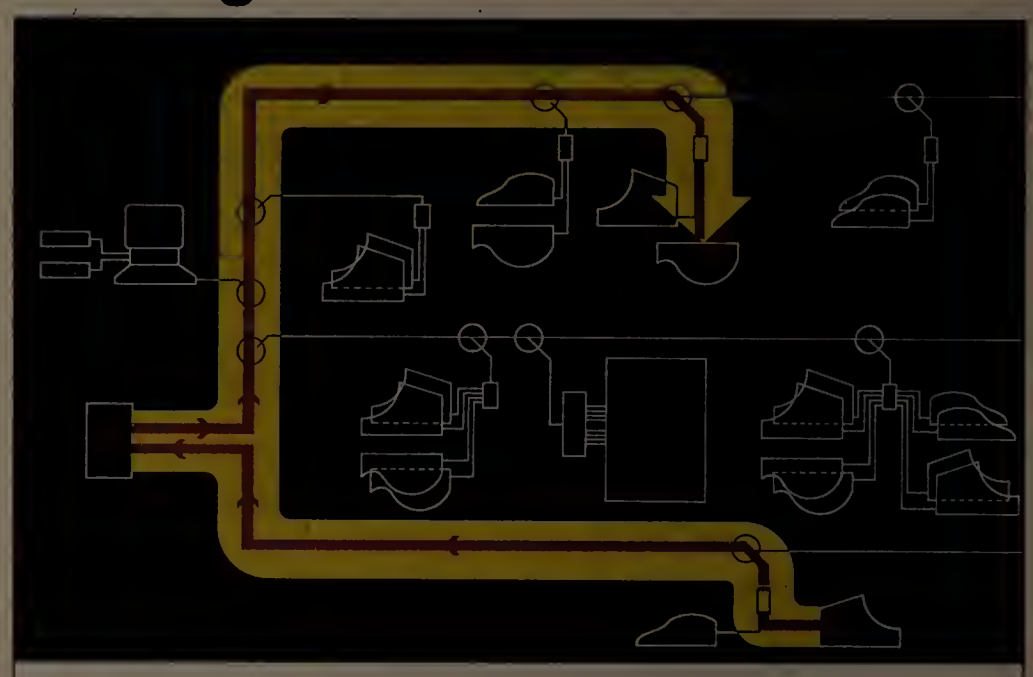
New from Interactive Systems/3M:

The first high-speed broadband local-area network that guards against data crashes.

If you've been thinking of investing in a contention network, consider this: How do you guard against data crashes during times of heavy system use?

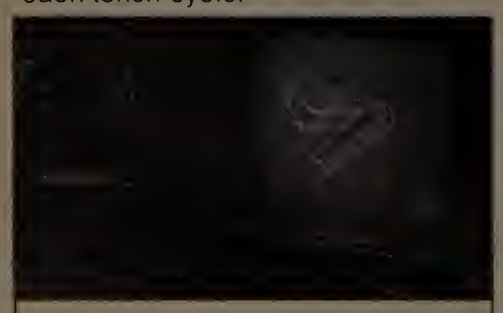
Answer: You don't, because contention schemes simply don't provide any kind of data insurance.

Fortunately, there is a new type of network that *does* protect against data loss. It's called 3M Videodata® LAN/1. And it's the first intelligent broadband local-area network that's designed to get data through on time, no matter how much traffic is on the cable.



In the Videodata LAN/1 network, messages can be sent from any terminal to any other without going through the host processor. Network Interface Units (NIUs) connect digital devices to mechanical taps (shown as small circles) on the main coaxial cable. A Network Monitoring Unit, or NMU, keeps a statistical record of network performance.

Videodata® LAN/1: The efficiency of token-passing plus the proven flexibility and expandability of broadband.
Token-passing networks eliminate contention troubles and data crashes by passing an electronic "token" from terminal to terminal. When a terminal has to transmit, it grabs the token and sends data packets to the receiving device. Receipt is acknowledged and the token is automatically released to continue its rounds. Because the system assigns a network entry address to each user, everyone has an opportunity to send data during each token cycle.



Because Videodata LAN/1 is a broadband system, dedicated channels can be used for full-motion video applications such as CAD/CAM and teleconferencing. These video signals are kept entirely separate from digital traffic on the network's token-passing channels.

So far, so good. But most token-passing networks are baseband systems, meaning that terminals must share a common channel as they would in a typical contention network. This can limit speed and capacity in some applications.

LAN/1 overcomes this possible limitation by combining token-passing with a proven *broadband* technology that allows many channels to be put on a single cable. The payoff: higher channel speeds, ranging up to 2.5 MB/s over a maximum seven-mile radius, with terminal data rates of up to 19.2 KB/s. Plus a capacity of up to 10,000 devices to allow plenty of room for future expansion.

Self-monitoring, with a printed record of network performance.
LAN/1 gives statistical proof of its own performance in printed form, thanks to a microcomputer-based Network Monitoring Unit (NMU). This unit, which also helps in routine maintenance and troubleshooting, may be used for remote monitoring as well.

Separate channels for voice, video, and graphics. Plus the ability to work in point-to-point applications.
Because LAN/1 is a broadband network, channels can be set aside for real-time voice, video, and high-speed graphics. This can be done without compromising digital traffic capacity.

LAN/1's broadband design also permits flexibility in network architecture, so that it can be used in high-speed point-to-point applications which can't be served efficiently with contention systems.

Other benefits include full transparency, an automatic shut-off feature to keep any one terminal from capturing the token, and compatibility with both dumb and intelligent terminals. The list of features goes on and on.

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LINKS from page 59

either plugged directly into a channel of the local computer system or into a remote front-end processor.

A 3276 is always a remote device, and its original form is a display terminal with a built-in controller for up to seven additional terminals. The terminals are connected to the controllers with a coaxial cable, and the remote controllers are plugged into the front-end processor through an RS-232 interface.

If your micro has a communications interface that can handle both asynchronous and synchronous links or if it is equipped with a synchronous interface, a commercial software package allows it to emulate a 3276. Then the micro is attached to the front-end processor, either directly or through a pair of modems.

A number of these products are available for a variety of micros, some using bisynchronous and others using SNA/SDLC protocols.

Another approach is to use an internal hardware board with specialized software that turns the personal computer into a 3278 display terminal. This is essentially the approach taken by IBM's 3270 Personal Computer, in which the software and hardware are intrinsic parts of the system.

Plug-in boards are available from numerous manufacturers for the IBM Personal Computer, compatible systems and other Intel Corp. 8088 systems, such as the Texas Instruments, Inc. Professional. These products require a port on a cluster controller, and the micro is attached via a coaxial cable.

Meanwhile, Radio Shack is marketing a single-user protocol converter at the micro, connected through an asynchronous RS-232C interface, which provides the 3278 protocol. The micro then runs a standard terminal emulator.

This can connect many Ascii devices, including all current Radio Shack microcomputers, to an IBM cluster controller — a much better approach than Radio Shack's earlier software-based efforts.

The 3780 RJE software is designed primarily to transfer files from one system to another. A 3780 is primarily configured to run batches of data between systems. If your problem is primarily that of transferring large quantities of data from one system to another in a reliable fashion, then this alternative may prove very attractive.

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WHEN YOU'VE GOT TO BE RIGHT.

AT&T
Information Systems

TOOLS from page 62

COMMUNICATIONS PROFESSIONALS
Dlock

Communications Professionals has introduced Dlock software, which reportedly provides file locking to users of Ashton-Tate's Dbase II running under Digital Research, Inc.'s CP/M 80.

Dlock provides a method of polling the user's keyboard to test for the presence of a keystroke, which allows programmers to interrupt long report-printing sessions, the vendor said.

Dlock is said to be a hex file in Intel Corp. 8080 code that loads into free memory and is accessed through a CALL command.

Dlock is priced at $150, according to the vendor.

Communications Professionals, Suite 1-238, 701 E. Bay St., Charleston, S.C. 29403.

CANION from page 59

place as an 80286-based machine might be doing."

AT&T is the only other major player, with an 8086-based IBM-compatible system and the strongest competition among IBM-compatible suppliers, Canion said. "AT&T will get the chance where most people won't, because of their name," he said. "But they will have to overcome all the hurdles that all the other companies have faced all along."

Other IBM-compatible manufacturers have been left in the dust, Canion said. "Last year, when we entered the marketplace, there was a race between several companies for shelf space and market acceptance," he said. "There was a window, and we got through it.

"Those that didn't, we don't really see as competitors," he said. "The competition for shelf space is more than an order of magnitude tougher than last year."

Compaq considered offering an 8086-based transportable system, "but we haven't seen a need for higher speed," Canion said.

The company also decided against offering a laptop computer at present "because we don't think it's possible to offer full-functioned personal computing in that kind of package." One requirement is a minifloppy disk drive, Canion said. Systems lacking such drives, such as the Hewlett-Packard Co. HP 110, are extensions of desktop systems rather than personal computers, he maintained.

In March, Compaq established a separate telecommunications subsidiary, Compaq Telecommunications Corp., with two charters, according to Canion.

"If you listen to people in the telecommunications market, there's a view of where the world's going to be in a few years that almost doesn't comprehend the personal computer market," he said. Similarly, those in the microcomputer industry typically have a weak grasp on telecommunications trends, although the two markets "are going to run into each other not too far down the road.

"We felt there was a strong need to get an effort going that was completely immersed in telecommunications, not just a group inside the personal computer world, but a separate company in a separate city," Canion said.

"So one main charter is to make sure we don't get blindsided by some new development," he said. "A second and equally important charter is to develop a telecommunications-based product that relates to the personal computer world.

"We view the market as very unforgiving today," Canion said.

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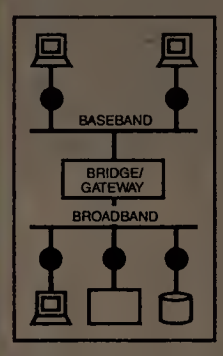

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TI from page 59

particular conclusion, TI said.

The Personal Consultant development software, with two sample knowledge bases, Integral Quality, Inc.'s IQ Lisp programming language and documentation, is priced at $3,000. A three-day product training course will cost $1,500, and knowledge engineering support will be provided at $1,000/day.

Runtime utilities are available for developers wishing to distribute multiple copies of commercial applications, the vendor said. The Personal Consultant runtime license costs $25,000, with an additional royalty fee of $25/copy of each application produced.

More information is available from Texas Instruments' Data Systems Group through P.O. Box 809063, Dallas, Texas 75380.

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COMPUTER INDUSTRY

RTI founder sees relational DBMS gaining user approval

By Paul Gillin
CW Staff

Like many early advocates of relational data base management systems (DBMS), Gary Morgenthaler remembers the lean days. In 1980, when he and a group of businessmen and computer scientists founded Relational Technology, Inc. (RTI), the conventional wisdom was still that relational "was good laboratory material, but could never run commercially.

Morganthaler

"We knew there would be a long period of market education to convince people what the research community had known for a long time — that relational was the way of the future," Morgenthaler said in a recent interview.

Recent announcements of relational or relational-like DBMS from the industry's top vendors have confirmed the research community's prognosis. But Morgenthaler, who is president and chief executive officer of RTI, said that while many DBMS now have a relational front end, true relational DBMS are still rare. "The advantage of a relational system is in providing a very high-level query language that doesn't require navigating through the data," he said. In most relational-like products, "you can present data as relational tables, but you can't change relations without going back to the data base administrator."

See **RTI** page 75

Oracle president enjoying relational DBMS' popularity

LAS VEGAS — As one of the first data base management system (DBMS) vendors in the relational market, Oracle Corp. President Larry Ellison is taking some satisfaction in relational's newfound popularity.

"I've said that by 1985 everybody will be buying relational DBMS," Ellison said in an interview at the National Computer Conference here recently. "It looks like that's coming true."

In particular, last year's relational DBMS announcements by Cullinet Software, Inc. and IBM prove that relational is viable as a high-performance DBMS, Ellison said. "[The fact that IBM is in the market] means that the Fortune 1000 market has realized that it's time to go relational," he said. That acceptance has translated into profits for Oracle, which is growing at 100% per year.

Ellison

Ellison said he believes IBM will gradually move all its customers over from its IMS DBMS to DB 2. He added that relational is only now beginning to reach its potential and that "no next step is apparent" to a new DBMS structure. "Relational is to data base what integrated circuits are to hardware," he said. "It just needed time to mature."

In the process of growing up, relational DBMS have had to overcome an image that they are too slow for

See **ORACLE** page 75

Holding back product details: IBM limits users' plans

INDUSTRY INSIGHT
Tom Henkel
CW Senior Editor

Perhaps the biggest point of contention in the European Economic Community's (EEC) four-year antitrust investigation of IBM has been IBM's policy of holding back specific technical details of its new products until those products are actually delivered.

As one industry watcher recently noted, the issue is sacred within IBM. And it is an issue that probably will always be a point of contention between IBM and makers of IBM-compatible devices. But it should also be a point of concern for users as well.

From the standpoint of IBM's dealings with its competition, the policy clearly gives IBM the advantage. Even while negotiators were haggling over the issue with the EEC in Brussels, IBM was continuing to hold back technical details on its products. One of the latest examples is the tape cartridge designed for use in IBM's recently announced 3480 tape drive.

Industry watchers agree that IBM, which recently beefed up its security policy for early delivery users, is being especially secretive about the cassette. The reason is obvious. If the cassette specifications were public knowledge, there would be 3480-compatible tape drives on the market in a matter of weeks.

In a world where the useful lifetime of products is growing shorter, every week that IBM can hold the competition at bay means higher revenues. An executive for Storage Technology Corp. (STC) admitted STC would have announced a 3480-compatible product weeks ago, but it could not get hold of the cassette unit. Thus far, IBM has been successful in keeping the cassette locked up within beta users' shops. But the STC executive seemed confident an IBM 3480 cassette would somehow find its way into STC's hands in a relatively short time.

The fact that IBM holds vital information back is just another sign of what everyone already knows: IBM is a masterful competitor. Learning to deal with that situation is a fact of life for IBM competitors.

But what impact do these cloak-and-dagger episodes have on users?

There are already rumors that IBM is having problems making the 3480 operate properly, and early deliveries of 3480s have reportedly been delayed.

See **IBM** page 75

MSA

■ Management Science America, Inc. posted a disappointing second-quarter loss after failing to close some major large-package sales, and Peachtree Software, Inc. did not sell microcomputer software as well as had been expected/**71**

■ Sperry Corp. still expects wafer-scale integration to play a role in its next generation of computers/**71**

■ A Canadian software firm hopes to carve out a variety of niches in the U.S. market/**72**

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MSA reports $1.7 million loss, Peachtree sales down

By Peter Bartolik
CW Staff

ATLANTA — Management Science America, Inc. (MSA) recently reported a second-quarter net loss of $1.7 million, or 10 cents per share, as revenues declined $4.7 million from the year-earlier quarter.

The company, which had earlier announced it anticipated a loss, said the revenues for the quarter were below forecast due mainly to delays in closing a number of large multipackage agreements. But a spokeswoman confirmed, however, that revenues from its Peachtree Software, Inc. subsidiary fell about $3 million below estimates.

A spokeswoman for MSA said the revenues for the quarter were about $10 million below what had generally been estimated. About $7 million was due to delays in closing sales on mainframe packages and the remaining $3 million due to less-than-expected sales by its microcomputer software subsidiary, the spokeswoman said.

Surprised stock analysts

MSA, which generally experiences seasonal revenue surges with most sales being closed in the fourth quarter, had surprised stock analysts in the first quarter with an unusual small profit in what traditionally has been a losing quarter. It was expected to perform better in the second quarter.

The company posted revenues of $31 million, compared with $35.6 million in the second quarter of 1983. Profits in the year-earlier quarter were $3.2 million, or 18 cents per share, the company said.

Kenneth Burke, an analyst with the Baltimore investment firm of Alex Brown and Sons Research, noted, "It was the second time in six months that MSA had disappointed the stock community," resulting in a plunge in the price of the company's stock following the July 11 announcement of an expected loss. Early this year, MSA had announced profits were up only one cent per share, far less than expected.

Burke speculated that while MSA may make up the shortfall in large package sales in the third or, more likely, the fourth quarter, the microcomputer software problem "will not resolve itself soon."

With microcomputer manufacturers other than IBM not experiencing a good year, sales of Peachtree products to OEMs "are much lower than last year," Burke said.

Despite the company's heavy investment in new Peachtree products and marketing, Burke said MSA's expenses for its Peachtree subsidiary "are pretty well in line" with industry levels. Micro software, he added, "is not like the mainframe business where you've got to put in a lot of fixed costs."

Overall, Burke said, MSA's stock is probably of a higher value than is presently being traded, but the company has to rebuild its integrity in the eyes of investors.

Jetro fair hopes to stimulate U.S. export to Japan

NEW YORK — The Japan External Trade Organization (Jetro) recently announced here it hopes to stimulate U.S. exports to Japan by inviting U.S. companies to display their products at what is planned as the largest business-only import fair ever held in Japan for American products.

Cosponsored by the U.S. Department of Commerce and the Nagoya Import Fair Foundation, with the support of Japan's Ministry of International Trade and Industry, the March 11-14 "Made in USA Fair" is expected to attract some 300 exhibitors, Jetro said.

Mitsuaki Sato, chief executive director of Jetro in New York, said his organization believes Japan, while already the second largest U.S. export market in the free world, has even greater potential for U.S. manufacturers.

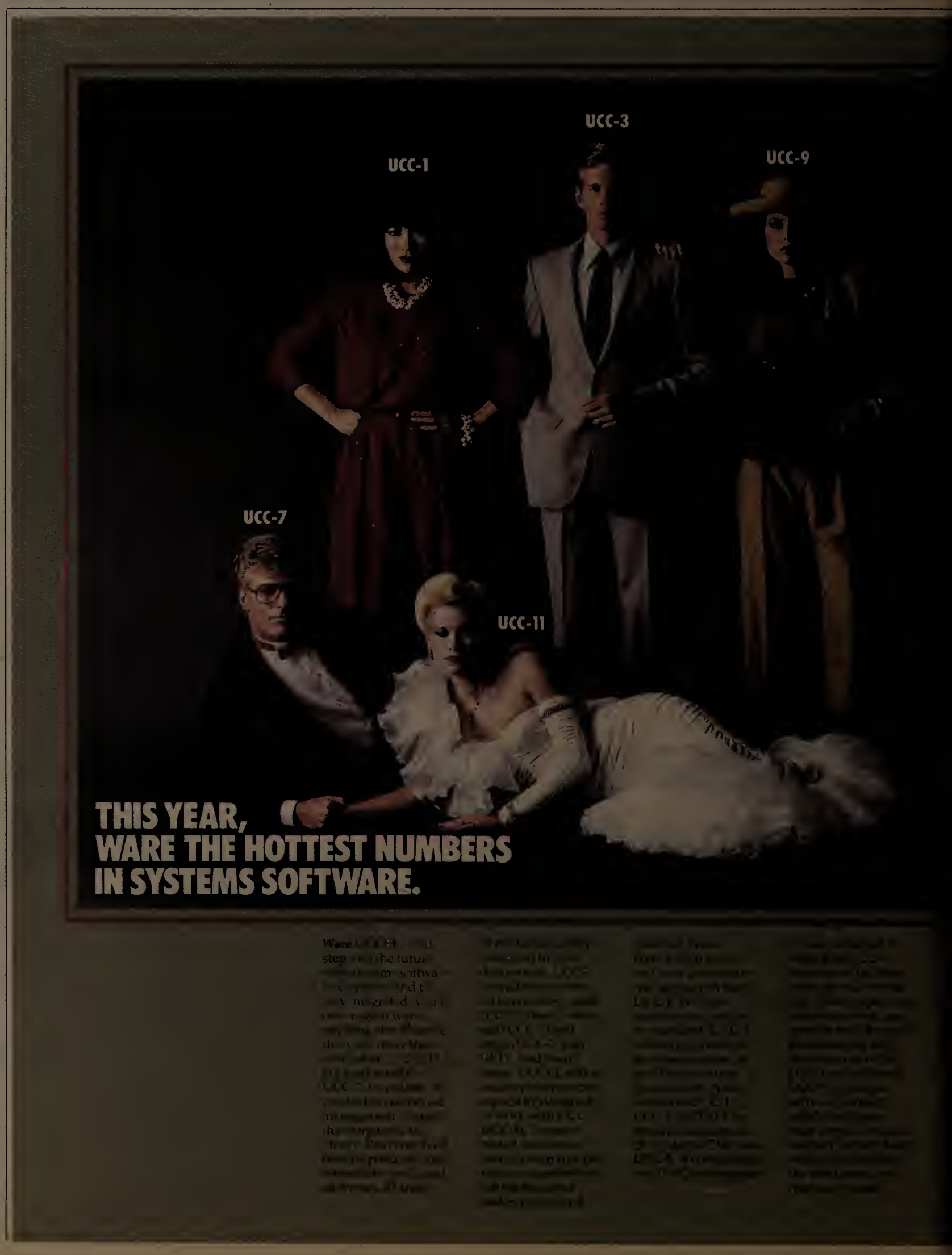
Providing assistance

"Although some large American companies are trading successfully in Japan, many smaller companies need an organization to help them establish themselves in a new market," Sato said. "Jetro has the capability to provide this assistance."

He said U.S. companies must often overcome language and cultural differences to succeed in Japan, and the organization will advise exhibitors on how to present their products to the Japanese, as well as identify and introduce potential customers to each exhibitor.

Exhibit space will be provided free of charge at the 80,000 sq ft International Exhibition Hall in Nagoya, Jetro said. Travel- and shipping-related costs will be the responsibility of exhibitors.

Registration forms must be returned by Nov. 20 and are available from Jetro offices in Chicago, Houston, San Francisco, Los Angeles and in New York at Jetro, 1221 Ave. of the Americas, New York, N.Y. 10029.



COMPUTER INDUSTRY

Wafer-scale integration remains in Sperry's plans

By Peter Bartolik
CW Staff

SAINT-PAUL-DE-VENCE, France — Despite the recent write-off of its investment in Trilogy Ltd., Sperry Corp. still expects wafer-scale integration semiconductors to play a role in the design of its next large-scale computer, according to the head of the company's computer operations in the UK.

David Crofts, vice-president and general manager of Sperry's Computer Systems Operations in the UK and managing director of Sperry Ltd., recently told a group of reporters here that the as-yet-unproven wafer-scale integration technology "is still very much part of [Sperry's] 1100 series plan and of the design for the machine that will follow the 1100/90."

Addressing a press seminar at the Sperry International Management Center here, Crofts noted that despite Trilogy's recent string of problems, "much of the Trilogy technology has already flowed through into our own semiconductor facility."

Investment in Trilogy

For its $42 million investment in Trilogy, Sperry obtained the rights to the use of the wafer-scale integration technology and also to the computer-aided design and manufacturing tools developed by Trilogy for building the semiconductor and its now-canceled large-scale computer.

Crofts was named head of the UK operations and Sperry's subsidiary there this past April. Previously, he was vice-president and managing director of Paradyne Europe, and before that, he held a number of posts with Honeywell Information Systems in the UK.

During his speech at the seminar, Crofts spoke of Sperry's "time of new strategy, of new products and of a new drive into areas of the marketplace where Sperry has hardly ventured before."

The computer systems operation, "the third and largest element" of Sperry's strategy, according to Crofts, will offer total systems solutions and ensure Sperry "will continue to be a complete computer company with a full range of products," he said.

Sperry has joint agreements "for both software and hardware that will enable us to bring products to the market much quicker than if we tried to develop all products in-house," Crofts said. The recently announced Sperry personal computer was produced by Mitsubishi Corp., he noted.

The company has invested $100 million for research at its semiconductor facility in Eagan, Minn., where "leading-edge computer aided-design techniques are being used to develop Cmos chip sets that match the best the industry can produce," Crofts said.

Commenting on predictions that the shipped value of mainframes is expected to grow from $46 billion this year to $88 billion by 1988, Crofts said Sperry will "continue to be a leading contender" in that area.

Of the present 1100 series of computers produced by Sperry, Crofts said "the 1100 will be taken down to desktop level, to feature board level and finally to chip level, and at the other end, it will go up to more than 100 [million instructions per second]."

Additionally, "Sperry will be planning further implementations of Unix on the 1100, and that project will be the subject of announcements in the months ahead," Crofts said.

In the communications area, he said, tests have been successfully completed to integrate Sperrylink, the office information system, with Northern Telecom, Inc.'s SL-1 digitized private automatic branch exchange.

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Protectionism ingrained in Japanese business mart

OUTSIDE LINES
Alonzo D. Saunders

This is the first in a two-part series.

The Pacific Basin, and in particular Japan, now stands as the major market in the world for American computer firms, excluding the U.S. itself. Yet, doing business in Japan has always been extremely complex, due to trade barriers, historical factors and the legal system itself. While there is every indication that these legal issues are changing to be more favorable to Americans, there is also every indication they are doing so very, very slowly.

Protectionism is a term applicable to government attempts to protect local industries from foreign competition. The fact of the matter is that all countries engage in some form of protectionism, and indeed, there are international treaties (which Japan has signed) that allow countries to protect industries felt to be close to national security interests.

So the real problem with trade barriers is not their existence, but their degree, and Japan has never been reluctant to protect its local companies "by law or administrative fiat," according to Dr. W. V. Rapp, commercial counselor at the U.S. Embassy in Tokyo. The Japanese telecommunications industry was just such a government-protected monopoly until very recently, and in addition, there are both tariff and nontariff barriers that are used to protect domestic industry. For example, a company may find that there is no import quota covering a particular product, but that the company with the monopoly is just not buying.

Historical factors

Japan's protectionist attitude is the result of long-standing, historical factors. As we remember, Japan simply shut its doors to the outside world for centuries until the mid-19th century, when Commodore Perry threatened to push them open with a cannon. But the commodore was unable to get any leverage against the larger industrial conglomerates known as the Zaibatsu. A century later, General MacArthur had difficulty dismantling the Zaibatsu and introducing Japan's trade barons to competitive winds after World War II.

Ancient trade barriers, combined with the power of the Zaibatsu, led, not surprisingly, to antimonopoly laws that are strict on paper, but which are in fact paper tigers. Japanese companies continue to be organized and operated in a way that would cause even the most hard-boiled American antitrust lawyer to blanch, and the Japanese government continues to be quite tolerant about monopoly behavior — and may even encourage such behavior through exemptions to the antitrust laws.

All of the nuts and bolts of commercial, legal activity such as the validity of contracts, licensing, patent protection, antitrust law, bankruptcy and private ownership of property are in place. So American businessmen taking a rating of the comfort level of Japanese law will be comforted. But what meets the eye is not all there is to the picture. For example, the Japanese Foreign Exchange & Foreign Control Law was enacted in 1980 to provide freedom of investment for foreign firms. Direct foreign investment is now allowed without restriction except in industries where the national interest is at stake.

However, foreign investors planning direct investment must give prior notice to the government and must file reports to the Japanese Ministry of Finance and the relevant industry involved three months prior to the investment. A 30-day waiting period is required after filing the notice. Furthermore, direct foreign investment includes virtually all of the types of investment that any American computer firm might make in Japan, including establishment of a branch office, establishment of a local company, buying shares in a Japanese company, long-term loans to a Japanese company and execution of a technical license agreement with a Japanese licensee.

Any American lawyer who has had to file notices and reports to any government knows that the procedures never work as smoothly as the regulations say.

And there is the problem known as transparency. To an American lawyer, this is the bane of a legal system because it means that the Japanese system often produces all too few regulations. The reason regulations may not exist is because everybody (that is, all the Japanese) knows what the rules are. They know the rules because they socialize and meet quite frequently in so-called industrial structure councils. Regulations form amid a consensus. And, as Dr. Rapp puts it, there is "no mechanism to see issues as they are evolving."

Saunders is a Boston-based attorney with a practice focusing on international marketing, antitrust and corporate finance.

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COMPUTER INDUSTRY

Canadian software firm setting itself up for U.S. marts

By Peter Bartolik
CW Staff

FRAMINGHAM, Mass. — The U.S. software market holds riches mainly for U.S. companies, but a Canadian firm believes it has a unique strategy to carve out a position in a large number of niches.

Sydney Dataproducts Corp., based in Vancouver, B.C., is one of the largest Canadian independent software companies, with revenues of approximately $60 million and a product list including about 70 packages, many directed at vertical markets.

While there is a visible shift among software vendors to offer diverse products, some might think that Sydney is carrying things a little too far — its products range from a mainframe relational data base down to microcomputer game packages. Additionally, its U.S. subsidiary has opened Sydney Learning Stores, with the dual purpose of selling products and teaching business people how to use computers.

But according to William Goodale, vice-president of the Los Angeles-based Sydney Dataproducts, Inc., the range from high-end to low-end products provides one more facet to differentiate the company. "We can take the vertical integration experience learned in the mainframe and superminicomputer area and apply that to the micro area," Goodale said. Additionally, he claimed, "The user-friendly concepts from microcomputers are carried over to the mainframe area." Perhaps more significantly, the wide range of product life cycles provides for a steady revenue stream, something that not all U.S. vendors can boast.

The Canadian parent company was formed in 1978 by its current president and chief executive officer, T. M. Williams, formerly a project management specialist with IBM. From its initial offering of a project management package for IBM mainframes, the company has expanded to offer a relational data base, graphics, modeling and spreadsheet programs for mainframes. A wide variety of vertical market programs for both Dataproducts Corp. superminicomputers and IBM Personal Computers have been developed, ranging from real estate modules to an interior decorator package for portable computers. And then there are entertainment packages featuring characters from cartoonist Johnny Hart's "B.C." and "Wizard of Id" comic strips.

The U.S. subsidiary was founded two years ago, but was little noticed "because it didn't have many products, and the company was smaller," according to Goodale. With more products — and one of the fastest growth rates of all Canadian companies over the past four years — the firm is back on track with its U.S. marketing effort, he claimed.

The subsidiary is attempting to bridge the void between software production and retail distribution. Company-owned Syndey Learning Stores in Los Angeles and Atlanta, franchises in Houston and Tampa, Fla., and a franchise scheduled to open soon in Phoenix are developing "what looks like a very powerful concept," Goodale said.

The stores were conceived to provide microcomputer-based training to business people who were not previously computer literate, according to Goodale. That itself is turning out to be an excellent market, he added. But each store, which sells products manufactured by other vendors, also maintains a staff of outside sales people, who develop the business market in that particular geographical location. "We are not going to make it based upon the walk-in traffic; we are going to make it based on going out to the business community," Goodale said.

The stores, if proven successful, will eventually be expanded nationwide to other major business centers, Goodale said, adding, "There is a need in business for that kind of education and training." The concept was not tried in Canada first, however. "We believe there is more potential here in the U.S.," Goodale said.

IDC acquires Yates Ventures

FRAMINGHAM, Mass. — International Data Corp. (IDC) recently announced the acquisition of Yates Ventures, a Los Altos, Calif.-based market research and consulting company specializing in microcomputer issues, particularly Unix.

Yates Ventures, founded by Chief Executive Officer Jean Yates, markets a series of continuing information services. It also publishes "The Yates Perspective," a monthly newsletter, and *The Unix System Encyclopedia.*

Precise terms of the acquisition were not announced, but IDC said a cash transaction of $7 million over a three-year period is anticipated. Yates Ventures was founded in 1982 and expects sales of $4.8 million for the current fiscal year, IDC said.

IDC is part of the privately owned International Data Group (IDG). IDG includes CW Communications, Inc., which publishes *Computerworld.*

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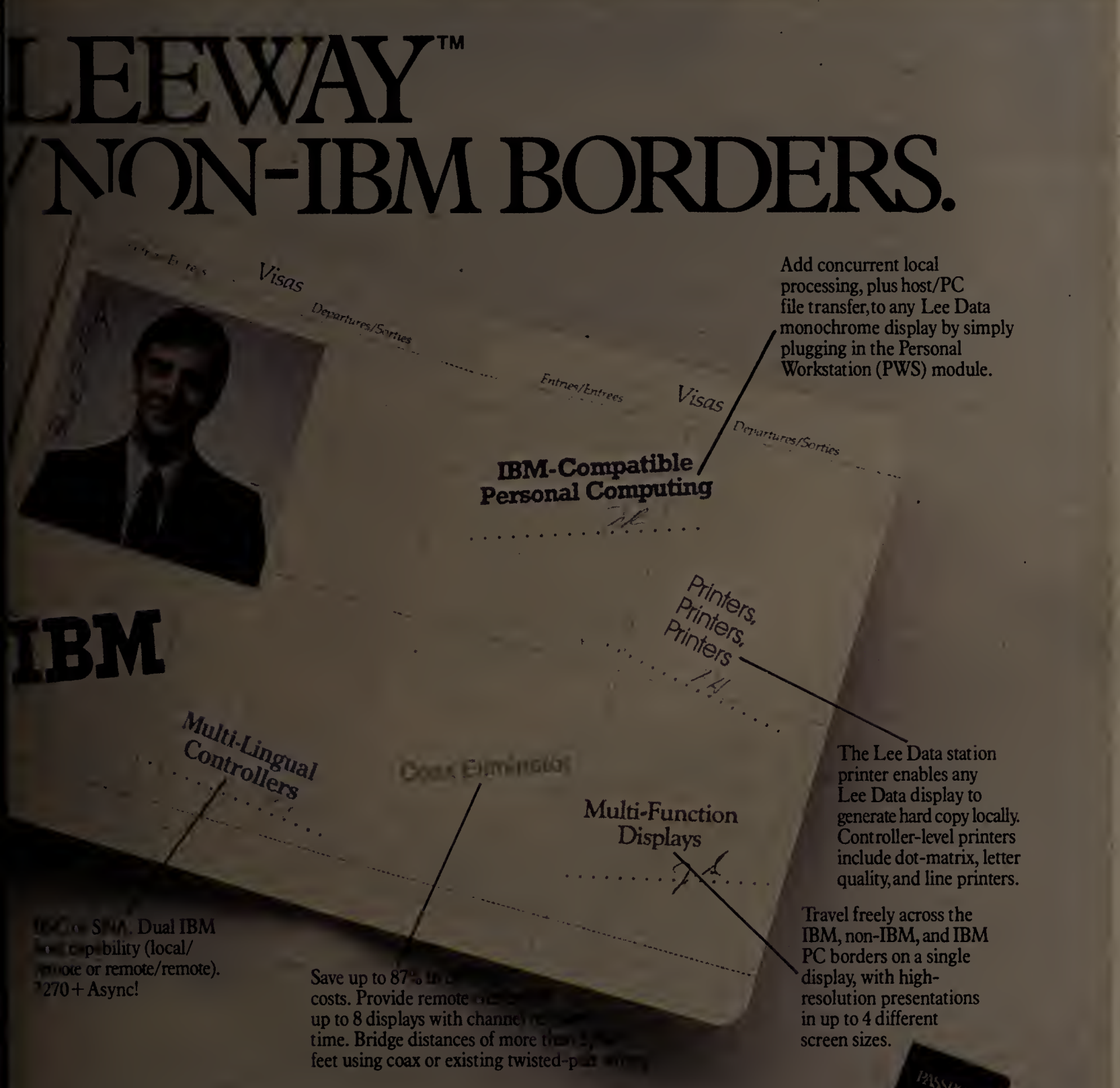

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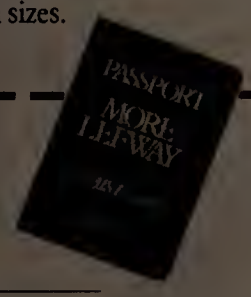

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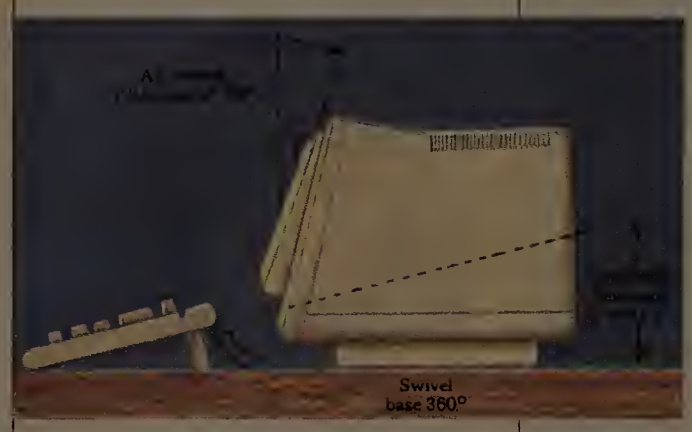

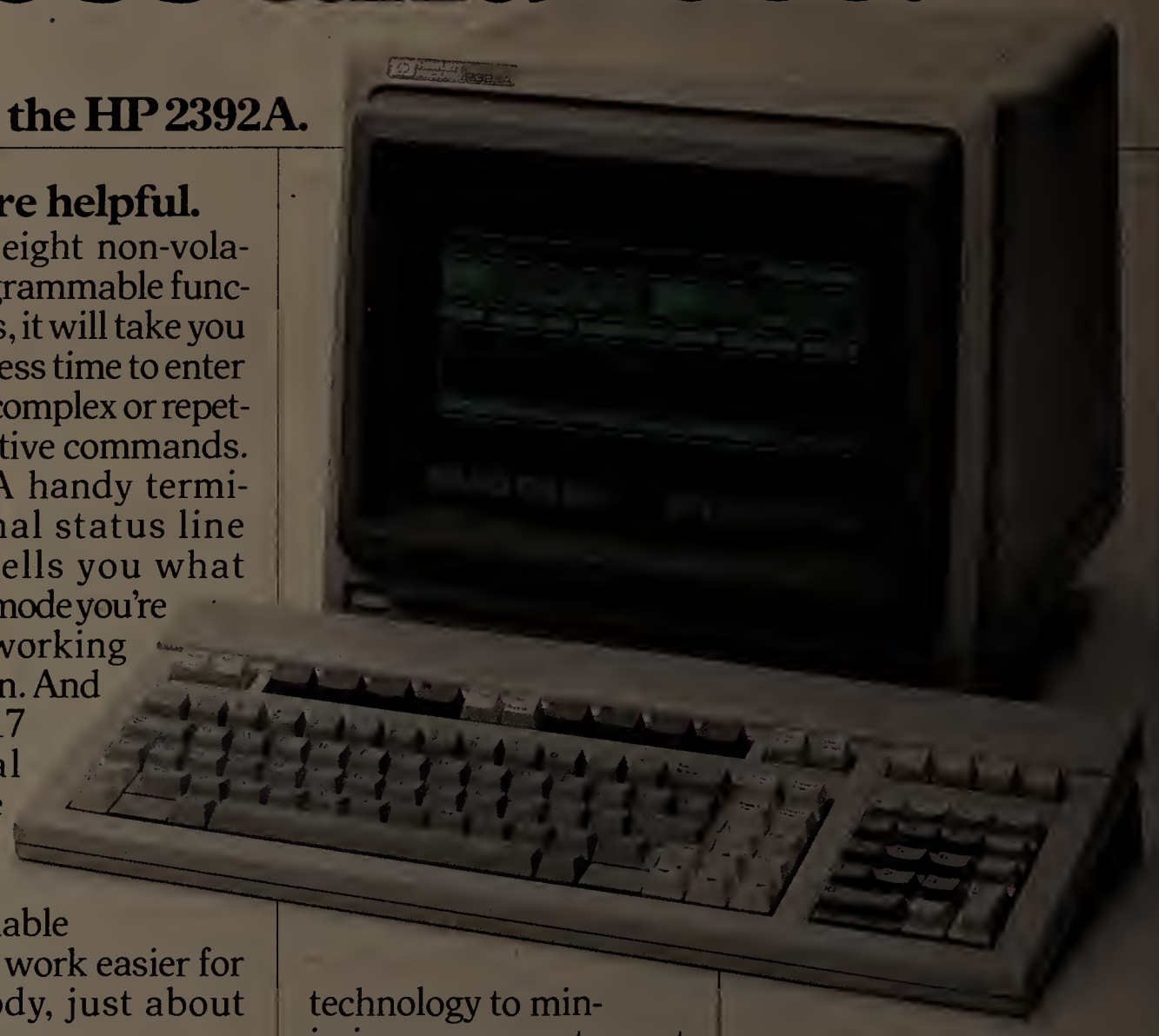

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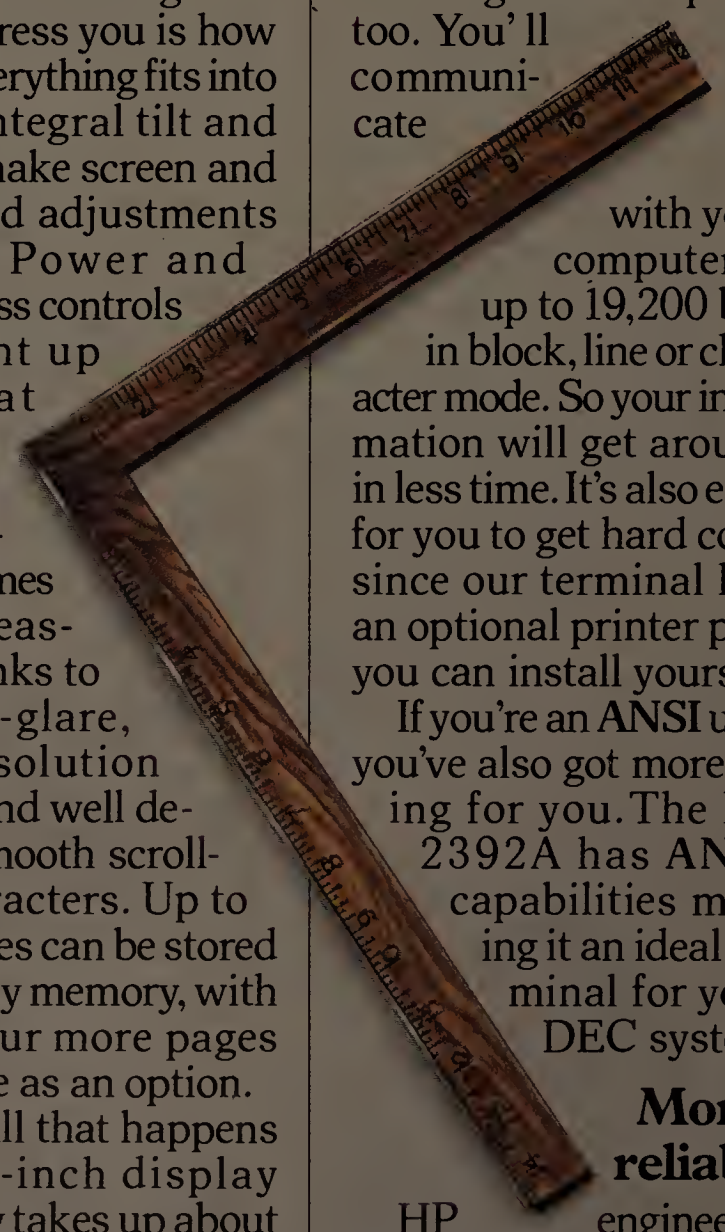

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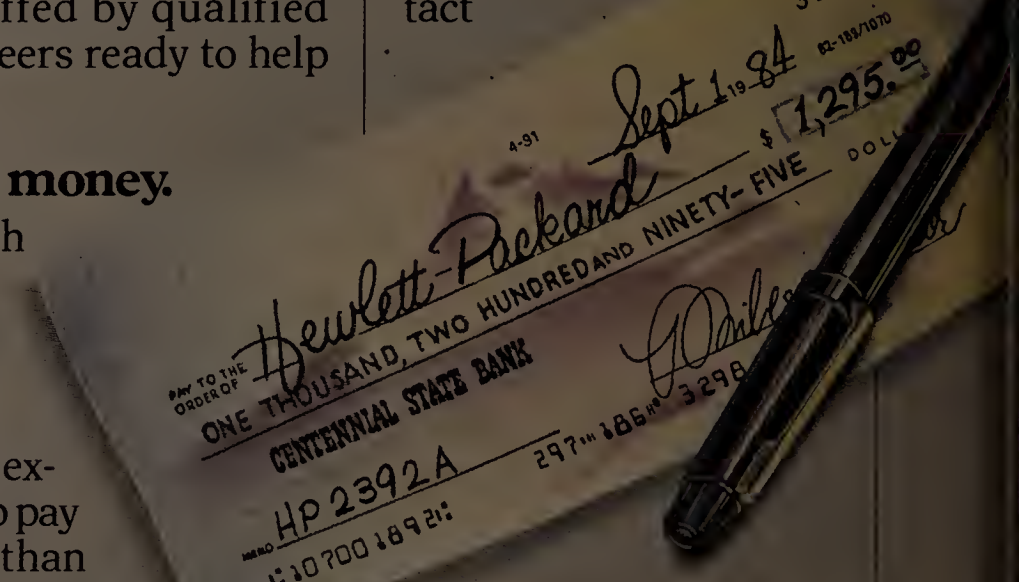

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ORACLE from page 69

high-volume production use. "The notion that relational has to be slow is a wall that is being broken down brick-by-brick," Ellison said. But he admitted that the argument has been valid in the past. "What made the early relational systems not perform well was not the technology. It was the fact that the products were new and not yet well designed," he said. He claimed that a recent benchmark by the U.S. Navy showed that Oracle was faster in a transaction environment than some conventional models.

IBM's choice of its SQL as a query language for its DB 2 product "has established SQL as a standard," he said. "For the first time, organizations will be able to standardize on the same language."

A primary strategy of Oracle has been to standardize on SQL and offer its product across a variety of hardware lines. Although Oracle was initially offered only for the Digital Equipment Corp. VAX-11 line, that market has fallen to under 50% of its customer base, Ellison said. Oracle is now available on all three IBM mainframe operating systems, as well as on hardware from Data General Corp., Honeywell, Inc., Hewlett-Packard Co., Apollo Computer, Inc. and all vendors supporting Unix.

Oracle has achieved portability by constructing its DBMS out of over 2,000 separate modules. Ellison said the modules are functionally separate so that the company can change only those that need to be changed to accommodate the new operating system.

The newfound popularity of relational systems has caused Oracle to seek new ways to differentiate itself from the rest of the market. In particular, Oracle is often compared with Ingres, another so-called true relational DBMS from Relational Technology, Inc. (RTI) (see story page 69).

Ellison said the primary differences between Oracle and Ingres are Oracle's portability, its IBM-compatibility and its performance. RTI President Gary Morgenthaler disputed Oracle's performance claims.

IBM from page 69

While such rumors often turn out to be false, they are reminiscent of the problems that forced IBM to delay deliveries of the 3380 disk drive a few years ago.

The 3380 delay, which turned out to be a problem with the then-new thin film recording heads used on the device, caused a near panic among memory-hungry users who had ordered the 3380 drives hoping to upgrade their disk storage capacity.

The result was a run on the older, and smaller, 3350 disk drives. It got to the point where some users were so desperate that they paid more than the original purchase price for used 3350s. Plug-compatible manufacturers, like STC, had a field day, selling as many 3350-compatibles as could be manufactured.

Is IBM getting sloppy? Is it announcing new products before they have been fully tested? It is too early to tell. But many industry watchers agree IBM made a colossal blunder with the 3380, which hurt the firm's reputation among its biggest mainframe customers. There is by no means conclusive proof that the same thing is going to happen with the 3480. But if it does, it will indicate IBM is having serious problems moving new products from the laboratory into the field.

Bear in mind that both the 3380 and the 3480 were designed with components that had not been used in earlier products. Unexpected problems have a way of cropping up in new technologies. But that explanation will offer little comfort to the user who suddenly has six months worth of planning destroyed by a letter from IBM.

Herein lies the problem with IBM's secretive approach. If users were given the opportunity to review all the specifications of a new product, they may be in a better position to decide for themselves whether the product sounds viable and how it compares with the competition. Furthermore, producing technical specifications at the time of announcement would prove a product actually exists.

RTI from page 69

RTI's Ingres DBMS was a laboratory relational DBMS at the University of California at Berkeley for several years before it hit the market. Offered originally on the Digital Equipment Corp. VAX-11 computer, the product is now geared toward the burgeoning Unix marketplace and will probably be ported to IBM mainframes in the near future. RTI recently signed a lucrative contract with AT&T Information Systems that will make Ingres the standard DBMS on AT&T's new 3B line of computers. RTI revenues grew to about $8 million in 1983, a 170% jump from the previous year.

Morgenthaler said users in recent years have gained "a strong understanding about what is and isn't relational." Although some vendors claim that the distinction is not important, Morgenthaler said a truly relational system offers "a real difference to users."

The truly relational DBMS uses referential integrity and relational calculus with a single data model, he said. A relational system also allows a more flexible interface to be used, in which queries can be formatted and changed interactively.

Perhaps the most significant argument against relational DBMS — that they are inherently inefficient — is being broken down, Morgenthaler stated. "We've improved the efficiency of Ingres tenfold since it was a research system, and I think its performance can be doubled again," he said.

Morgenthaler said two important trends will drive the use of relational DBMS for the rest of the decade. The first is its extension into the large-scale production environment. "In 1984, you're going to see them move into large-scale applications where flexibility and maintainability are a plus."

He said relational also will provide the path toward the long-sought goal of distributed data bases. "The long-term solution to the data base problem is to provide a single view of data, no matter where it resides," he said. A true distributed data base will consist of a single logical data base with multiple physical data bases in local areas.

However, Morgenthaler admitted that the barriers to distributed data base are imposing. One problem is concurrency control, or how to provide protection against deadlocks caused by concurrent updates to the same data base. Crash recovery procedures must be defined to ensure that the business can continue running if one or more nodes goes down. And query optimization has to be improved.

Ingres is often compared with its rival, Oracle from Oracle Corp. (see story page 69). Morgenthaler offered what he sees as the key differences between the Oracle DBMS and Ingres. "We have been more focused than they have," he said, "and over the last two years, they've added no new functionality to the system." (Oracle recently announced Release 4.0 of Oracle, which reportedly works two to 15 times faster than previous products.) "Our strategy is to offer more functionality and better reliability."

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The Federal Reserve System is preparing a Request for Information (RFI) about the availability of encryption hardware and software. The Federal Reserve operates a large, national data communications network that is compatible with IBM's System Network Architecture (SNA). Encryption technology manufacturers and vendors may request to receive the RFI package, which will be distributed on or about August 15th, 1984. This is not a solicitation; it is a notice only.

All requests to receive the RFI must be in writing; telephone calls cannot be accepted. Requests must be accompanied by a copy of the latest Annual Report or a recent financial statement of the firm making the inquiry.

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COMPUTER INDUSTRY

Convergent halts production of Workslate micro

By Kathleen Sullivan
CW West Coast Bureau

SANTA CLARA, Calif. — Citing lower than anticipated sales of its briefcase-size Workslate computer, Convergent Technologies, Inc. recently discontinued production of the machine and transferred 130 workers to other divisions within the company.

Allen H. Michaels, Convergent's president and chief executive officer, initially emphasized that the production stoppage was a temporary one, saying that manufacturing would resume when the current inventory backlog diminished. However, the company later posted second-quarter earnings including a net $8.5 million write-off from discontinuance of the Workslate division (see related story below).

Michaels attributed the Workslate's disappointing sales to an "embryonic" market that was not ready for the computer, which combined a tape recorder, electronic appointment calendar and computer in a 4-lb package that sold for $1,195.

But analysts questioned whether the company would resume production at a later time. John Kiefer, senior analyst at Infocorp, a Calif.-based market research firm, noted that the Workslate accounted for only a small percentage of the firm's revenues. In 1984, he estimated, Convergent would have received about $10 million from sales of the Workslate, while total company sales are projected to reach between $300 to $350 million.

When the Workslate was introduced about a year ago, it marked the company's first foray into the portable market, as well as the retail field. Convergent sells workstations and superminicomputers through OEMs. "It was a significant departure strategically from the business they knew very well," Kiefer explained.

Kenneth Churilla, microcomputer analyst with Creative Strategies International, Inc., a Calif.-based market research firm, agreed, saying the company had "ventured into a very different marketplace" when it introduced the Workslate. Churilla said the company was unable to compete against firms selling similar computers at 30% to 40% less than the Workslate.

Kiefer said the company will probably never resume production of the portable computer. "It won't continue to dilute its resources on the Workslate," he said. Instead, the company will focus its efforts on its traditional market, selling computers on an OEM basis, he predicted.

According to Kiefer, Convergent's "Megaframe," a 32-bit multiprocessor superminicomputer, and the firm's recently introduced "Miniframe," a single processor, Unix-based computer, are "unqualified successes."

And Kiefer described the company's "Ngen," a 16-bit, multifunction workstation, as Convergent's "golden egg."

Convergent recently announced it would not take any more orders in 1984 for the new computer.

Shutdown yields quarterly losses

SANTA CLARA, Calif. — Convergent Technologies, Inc. said its decision to discontinue its Workslate portable computer division accounted for a $6.5 million loss, or 17 cents a share, in the second quarter, which ended June 30.

The company said the loss included a provision of $15 million during the quarter, reflecting the discontinuance of the lap-size Workslate (see related story above). The loss compared with a profit of $4.6 million, or 12 cents a share, during the same period a year ago.

The company said its revenue for the second quarter rose to $85 million from $42.5 million a year earlier.

Allen H. Michaels, president and chief executive officer, said in a statement that the Workslate was discontinued because of a "lack of consumer acceptance at this time of portable computer products."

Michaels also said the company is continuing to invest heavily in new product development efforts.

Convergent, which sells most of its larger computers to OEMs, such as NCR Corp. and Burroughs Corp., had tried to enter the direct-sales market with its Workslate model, which currently costs $1,195. The company said last month that it had sold 10,000 Workslates since they were introduced last fall.

Some industry analysts, commenting on Convergent's second-quarter results, said the company is too dependent on customers such as Burroughs and NCR and needs to broaden its base of OEM customers.

"They really need to land some additional accounts, unless NCR and Burroughs can stimulate some more sales," said Alan Hirsch, microcomputer editor at Datapro Research Corp.

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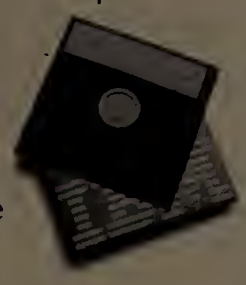

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Printer Port	YES	OPTIONAL	YES	OPTIONAL
Communications Port	YES	OPTIONAL	YES	YES
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Turnover rate down: AEA

PALO ALTO, Calif. — For the fourth straight year, turnover among employees in the electronics industry has declined, according to the American Electronics Association.

Turnover declined 21.4% in 1983 compared with the previous year, a survey of 979 association members found. The 1983 rate compares with previous declines of 23.1% in 1982, 24% in 1981, 26.3% in 1980 and 35.4% in 1979.

The turnover rate in the electronics industry was still considerably higher than the approximately 10% turnover in basic manufacturing industries in 1983, according to U.S. Bureau of National Affairs statistics.

The association's annual survey found that the turnover rate for nonexempt employees — those who receive overtime pay — dropped to 23% last year, down from 25.5% a year earlier. Turnover for exempt, or salaried, employees was 16.9%, up slightly from 16.6% in 1982.

"The underlying employee turnover rate in the electronics industries has declined significantly during the past four years," said Joe Weber, human resources manager for the association. "I would expect the rate to stabilize as the industry matures."

The San Francisco metropolitan area, including the Silicon Valley, had the highest turnover rate in 1983 of 27.8%. The Midwest had the lowest rate at 10.4%.

Small companies had higher turnover rates than larger ones. Companies with 100 or fewer employees reported the highest turnover rate, 31.6%, while firms with more than 1,000 employees had a 19.1% rate.

Other rates based on company size were: 101-250 employees, 28.1%; 251-500, 25.4%; 501-1,000, 20.3%.

Court ruling opens way for SDC to resume work on FBI delivery

CAMARILLO, Calif. — System Development Corp. (SDC), a Burroughs Corp. subsidiary, said recently it is prepared to resume full production and delivery of secure microcomputers to the Federal Bureau of Investigation in the wake of a U.S. Court of Appeals ruling authorizing reinstatement of a contested contract.

The Appeals Court July 16 vacated a decision by a federal district court that had overturned the contract award based on a challenge by Delta Data Systems Corp., which claimed to have submitted the lowest bid. A federal oversight agency, the General Accounting Office, had also disputed the FBI's rationale for granting the bid to SDC.

Following the Appeals Court ruling, SDC President Fred Jenny said: "We have been confident from the beginning that, despite Delta Data's allegations, the FBI had followed strictly all laws and government procurement practices in awarding the contract to SDC. The FBI will be receiving, at the lowest cost, state-of-the-art computer equipment that meets the bureau's special needs."

The $48.6 million contract includes terminals and printers said to be shielded to be resistant to electronic eavesdropping.

AT&T, CDRS ink marketing pact

CHICAGO — AT&T recently announced a cooperative marketing agreement with Comdisco Disaster Recovery Services, Inc. (CDRS) to offer computer users a service for recouping from catastrophic failures in data processing centers.

The agreement provides for AT&T Communications to supply CDRS with the Accunet Reserved 1.5 Service as a means for transferring data to support disaster recovery.

CDRS, a wholly owned subsidiary of Comdisco, Inc., the Rosemont, Ill.-based computer lessor, said it provides an alternative data center and data communications if subscribers' own facilities fail for any reason.

According to Raymond Hipp, president of CDRS, "We need a very sophisticated network to run our business, but we didn't want to be in the network business ourselves. We needed a network manager."

Firms to offer 32-bit OA line

SANTA CLARA, Calif. — National Semiconductor Corp. and Burroughs Corp. announced last week that Burroughs will develop a line of advance office automation products based on National Semi's Series 32000 family of 32-bit microprocessors.

The companies also announced they will cooperate on developing enhanced versions of AT&T's Unix System V Release 2 operating system for the Series 32000 family as part of the software development required for Burroughs' new equipment.

Bob Freund, director of software products with National Semi, said the agreement is the first of its kind between a major OEM and a semiconductor company.

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SUPERSHORTS

Kidder, Peabody & Co. and **Telesis Systems Corp.** announced the formation of a $4.6 million research and development limited partnership to develop full-function computer-aided engineering software for designing system-level components for electronic products.

■

Avanti Communications announced an agreement by which **Codex Corp.** will market Avanti's new high-speed digital T-1 multiplexer. Terms of the agreement were not available.

■

Ferranti Inforgraphics, a Scotland-based firm that specializes in computer-aided design, has established a U.S. subsidiary to launch its CAM-X design system in the U.S. market. The branch has been established in the Huntington Beach, Calif., plant of Ferranti Electro-Optics, Inc.

■

GTE Communication Systems Corp. and **Wang Laboratories, Inc.** announced an agreement in which the two companies will jointly develop a link between Wang computer products and GTE's Omni family of integrated voice/data private branch exchanges.

■

American Satellite Co. (ASC) officially began providing communications services to businesses in the Atlanta area when it opened a central office transmission facility. The central office will provide voice, data, facsimile and video teleconferencing services via satellite and will connect with ASC's national communications network.

■

Techland Systems, Inc. announced it is signing an agreement with **Fox Research, Inc.** to provide a Systems Network Architecture Bluelynx Gateway for the Fox 10-Net local-area network. The retail value of the OEM agreement is expected to be more than $2 million over the next year.

■

CTS Corp. has just been awarded $934,359 by the **Indiana Corp. for Science and Technology** to support a three-year program to develop high-reliability, lower cost ceramic contact materials as possible substitutes for gold in critical electrical circuit applications.

■

Excelan, Inc. has concluded an agreement with **Zilog, Inc.** whereby Zilog will license Excelan's Exos Ethernet front-end processor technology for Zilog to build into its System 8000 high-performance Unix systems. Because Excelan expects to announce this technology transfer as a standard program in the near future, the license and royalty terms of the current agreement with Zilog were not revealed.

■

Tri Star, Inc. has combined its DP consulting operations with its corporate subsidiary, **Software Technologies and Research, Inc.**

■

Litton Industries, Inc. has announced the formation of a nationwide computer time-sharing organization in support of its remote computer services markets. The new organization, Litton Computer Services, comprises three formerly separate time-sharing operations, Litton Mellonics Information Center, Litton Computer Services and the Data Services Operation.

■

Northern Telecom, Inc. and **NCR Corp.** announced that they have signed a joint development agreement to equip Northern Telecom's Mercury 8-in. Winchester disk drive with a small computer systems interface, which will link a computer to the disk drive.

■

AT&T announced the opening in Tokyo of a Unix systems office that will be responsible for the marketing, licensing and support of software products in the Far East. The company also announced it will produce a standard Japanese version of Unix System V.

■

Intel Corp. has leased a plant in Singapore to assemble single-board computers. The 60,000-sq-ft plant, leased from a Singapore government agency, will begin operations in September.

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HP, Alsys ink software pact

WALTHAM, Mass. — Alsys, Inc. and Hewlett-Packard Co. announced recently the signing of a multiyear agreement for Alsys to deliver its Ada root compiler software, which HP will make available on its equipment.

Alsys, the U.S. subsidiary of Alsys S.A. of La Celle Saint-Cloud, France, said its root compiler software comprises over 80% of the work needed to construct a full Ada compiler.

Under the agreement, HP will take the Alsys system and program onto it code generators and runtime programs for its systems. Spokesmen for the companies said the agreement is expected to shorten the period required for HP to make its Ada compilers available. The compilers will make it possible for programmers to develop application programs in the Ada language on HP equipment.

Alsys was founded by Dr. Jean D. Ichbiah, who headed the "green team" at CII-Honeywell Bull that designed the Ada language.

Lotus profits up

CAMBRIDGE, Mass. — Lotus Development Corp. said its profit for the second quarter, which ended June 30, was $7.6 million, or 48 cents a share, compared to $1.7 million, or 13 cents a share, a year earlier.

Revenue for the second quarter rose to $32.6 million from $7.8 million a year ago, a company spokesman said.

Profit for the second quarter of 1983 included utilization of a net operating loss carry-forward equal to $71,000, or 1 cent a share, the company said.

Mitchell D. Kapor, company president, explained that the strong earnings reflected "record levels of demand" for the the company's 1-2-3 software program.

Kapor said nearly all of Lotus' second-quarter profit was from 1-2-3, since the company's second product, Symphony, did not begin shipping until late June.

MCI profits drop

WASHINGTON, D.C. — MCI Communications Corp. said its second-quarter profit dropped to $33 million, or 14 cents a share, from $54.6 million, or 23 cents a share, a year earlier.

The company said its profit fell because of the "substantially increased" access charges it has paid to local telephone companies this year, which are associated with the divestiture of AT&T.

Revenue rose 33% to $484.8 million from $363.8 million for the same period a year ago.

MCI said access charges will continue to rise as the company obtains equal-access facilities. However, the costs of leased lines should continue to decline as a percentage of revenue in future quarters, the company reported.

Stratus nets gain

NATICK, Mass. — Stratus Computer, Inc. reported its profit for the second quarter, ended June 30, rose to $1.3 million, or 7 cents a share, from $281,000, or 2 cents a share, a year earlier.

Revenue increased 102% to $9.3 million from $4.6 million a year ago, a company spokesman said. Second-quarter 1984 profits included $500,000, or 3 cents a share, from tax loss carry-forwards, the spokesman reported.

William E. Foster, company president, said the company was "extremely pleased" with the quarterly results.

Tandem airs gain

CUPERTINO, Calif. — Tandem Computers, Inc. said its profit for the third fiscal quarter, ended June 30, increased to $9.2 million, or 23 cents a share, from $8.4 million, or 21 cents a share, a year earlier.

Revenue for the quarter rose 29% to $141.9 million from $110.2 million a year ago, a spokesman for the company reported.

James G. Treybig, company president, said Tandem "enjoyed a quarter of good revenue growth. We also added a significant number of new customers."

He said the company's Nonstop TXP computer accounted for a majority of the systems shipped during the third quarter.

STC posts loss

LOUISVILLE, Colo. — Storage Technology Corp. (STC) recently reported a second-quarter loss of $4.9 million, or 14 cents per share, compared with a year-earlier profit of $352,000, or 1 cent per share.

A spokesman for the company said the loss was significantly smaller than that reported in the first quarter, which was $16.7 million, or 48 cents per share.

For the second quarter ended June 29, STC reported revenues of $247.1 million, compared with revenues for the year-earlier quarter of $238.3 million.

For the first six months of fiscal year 1984, STC reported a net loss of $21.5 million, or 62 cents per share, compared with a profit of $1.5 million, or 10 cents per share, for the first six months of 1983.

Revenues for the six-month period were $484.9 million in 1984, compared with $452.1 million in 1983, according to the spokesman.

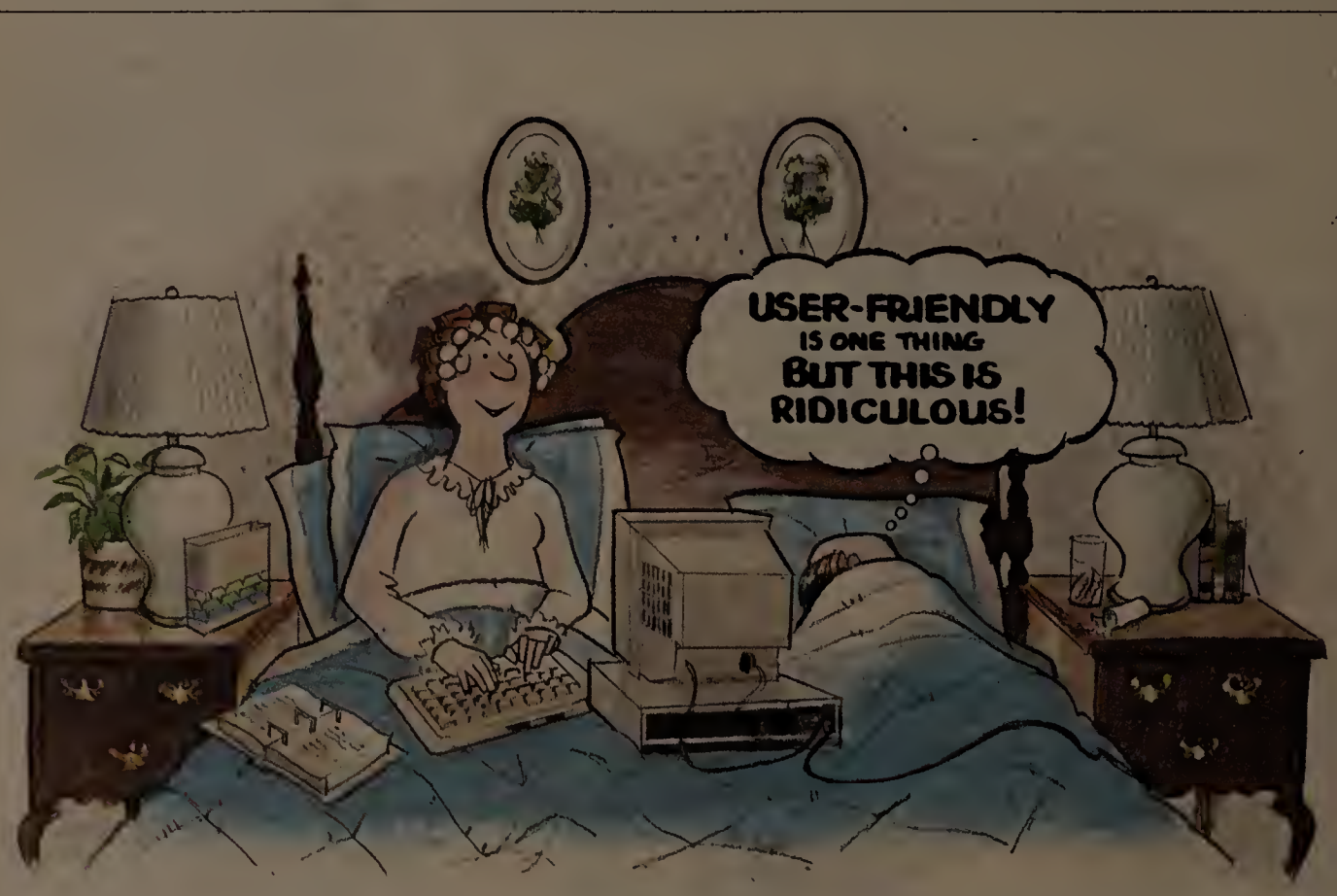
TI revenues up

DALLAS — Texas Instruments, Inc. recently reported second-quarter revenues of $1.4 billion, up 33% from the comparable quarter a year earlier when revenues were $1.09 billion.

Profits for the quarter ended June 30 were $85.9 million, or $3.57 per share, compared with the year-earlier loss of $119.2 million, or $5 per share, credited to TI's then-flagging home computer business that was subsequently disbanded.

Semiconductor operations reached new quarterly highs as demand continued to be strong across most geographical and product areas.

The company's data systems segment experienced increased growth over the year-earlier period.



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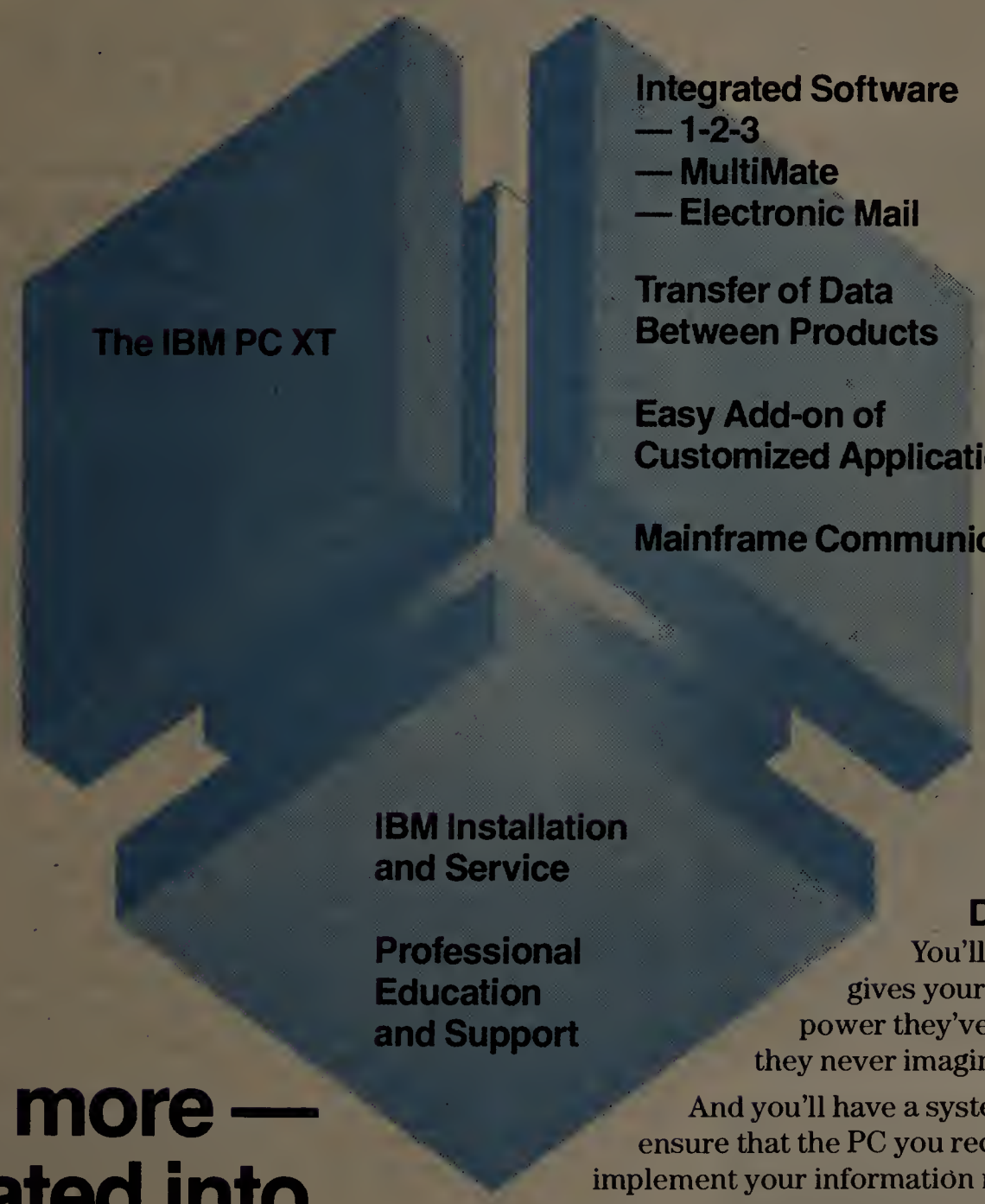

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COMPUTER INDUSTRY

5¢ 10¢ NICKELS AND DIMES

Lee Data Corp. announced that its revenues for its first quarter ended June 30 were $23.9 million, compared with $18.5 million one year earlier. Profits were $2 million, or 15 cents per share, compared with $3.4 million, or 25 cents per share, in the prior year.

■

Advanced Micro Devices, Inc. reported first-quarter profits of $38 million, or 66 cents per share, compared with $8.1 million, or 14 cents per share, one year earlier. Revenues were $234.2 million, compared with $108 million in the first-quarter of last year.

■

Cognos, Inc. reported profits for the three-month period ended May 31 of $744,830, compared with $69,200 one year earlier. Revenues grew to $7.2 million, a 58% increase over the same period last year.

■

Entre Computer Centers, Inc., franchisor of retail computer stores, announced record revenues and profits for its fiscal third quarter ended May 31. Revenues for the third quarter were $8.1 million, a 216.1% increase over $2.5 million for the same period in fiscal 1983. Profits for the third quarter were $2 million, or 21 cents per share, an increase of 706% over last year's third-quarter profits of $249,000, or 3 cents per share.

■

Megadata Corp. announced profits for the second quarter ended April 30 of $489,001, or 42 cents per share, compared with $224,165, or 20 cents per share, for the same period one year earlier. Revenues increased 42% to $4.5 million, compared with $3.1 million a year earlier.

■

BPI Systems, Inc. reported a loss for the first quarter of $71,281, or 2 cents per share, on revenues of $2.4 million. The results compared with last year's first-quarter profits of $414,557, or 9 cents per share, on revenues of $2.2 million.

■

Mentor Graphics Corp. reported that profits for the second quarter rose to $2.1 million, or 16 cents per share (including an extraordinary tax benefit of $575,000, or 4 cents per share) from a net loss of $889,000, or 39 cents per share, for the second quarter one year ago.

■

Seeq Technology, Inc. reported profits of $509,000, or 4 cents per share, for its third fiscal quarter ended June 30, compared with a loss of $3.8 million, or $1.74 per share, for the comparable period a year ago. Revenues were $13.8 million, compared with $2.6 million in the same quarter one year earlier.

■

Apollo Computer, Inc. reported second-quarter revenues of $46 million, compared with $17.6 million for the same period one year ago. Profits were $5.1 million, or 17 cents per share, compared with $2.6 million, or 9 cents per share (excluding $1.2 million, or 4 cents per share, derived from an extraordinary tax benefit) for the second quarter of 1983.

■

Applied Computer Techniques, Inc. announced revenues of $76.1 million for the year ended March 31, up 123% from $34.1 million for the previous year. Profits were $6.9 million, or 37 cents per share, compared with $3.2 million, or 19 cents per share, for the previous year.

■

Kaypro Corp. announced profits for the third quarter ended May 31 of $3.2 million, or 9 cents per share, compared with $3.1 million, or 9 cents per share, for the comparable period in 1983. Revenues were $32.5 million, compared with $19.6 million one year earlier.

■

Teledyne, Inc. reported profits for the quarter ended June 30 of $355.7 million, or $20.65 per share, compared with $72.6 million, or $3.54 per share, one year earlier. Revenues rose to $896.2 million from $738 million in the like period one year ago.

■

Silicon Systems, Inc. reported record revenues for the three months ended June 30 of $16.3 million, compared with $6 million for the like period of the previous year. Profits were $3.8 million, or 59 cents per share, compared with $69,000, or 1 cent per share, one year ago.

■

Systematics, Inc. reported revenues for the year ended May 31 of $78.7 million, an increase of 22% over the $64.3 million reported last year. Profits were $6 million, or 56 cents per share, compared with $4.6 million, or 45 cents per share, last year.

■

Siltec Corp. announced profits for the second quarter ended June 30 of $597,000, or 17 cents per share, compared with $235,000, or 7 cents per share, from one year earlier. Revenues were $15.8 million, a 45% increase over the second quarter of 1983.

■

LSI Logic Corp. announced revenues for the second quarter ended July 1 of $20.9 million, a 196% increase over the $7 million re-

See NICKELS page 84

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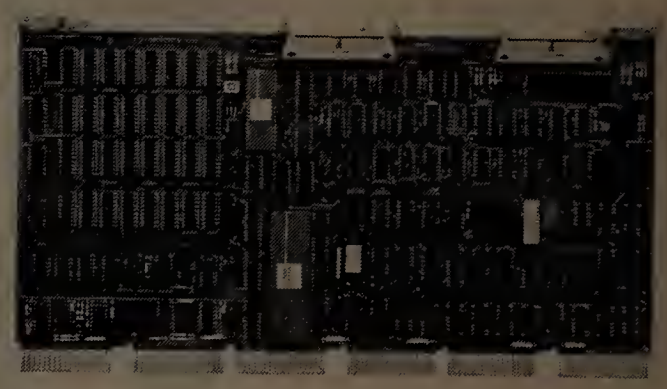

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COMPUTER INDUSTRY

NICKELS from page 82

ported in the same period one year ago. Profits were $3.9 million, or 15 cents per share, compared with $1.7 million, or 8 cents per share, in the comparable period one year ago.

■

Siliconix, Inc. reported second-quarter revenues of $21.5 million, a 42% gain over the $15.2 million reported a year earlier. Profits were $1.9 million, or 30 cents per share, compared with $1.2 million, or 20 cents per share, from the previous year.

■

Alpha Industries, Inc. reported revenues of $17.2 million for the first fiscal quarter of 1984, compared with the $13.8 million recorded for the same period last year. Profits were $1.2 million, or 18 cents per share, compared with $1 million, or 15 cents per share, reported one year ago.

■

Computer & Communications Technology Corp. announced revenues for its second quarter ended June 30 of $29.5 million, compared with $21.4 million in the same period one year earlier. Profits were $2.8 million, or 37 cents per share, compared with $861,000, or 11 cents per share, one year ago.

■

Adage, Inc. reported revenues for the first quarter of fiscal 1985, ended June 30, were $12.1 million, compared with $11.6 million for the comparable period last year. Profits were $780,000, or 17 cents per share, down from $1 million, or 22 cents per share, in fiscal 1984.

■

Zenith Electronics Corp. reported profits for the second quarter of $16.4 million, or 74 cents per share, compared with $10.6 million, or 50 cents per share, for the same period one year ago. Revenues were $424 million, compared with $324 million one year earlier.

■

Printronix, Inc. reported profits for the first quarter ended June 29 of $2 million, or 44 cents per share, compared with $1.5 million, or 35 cents per share, one year earlier. Revenues were $33.9 million, compared with $22.7 million a year earlier.

■

Tektronix, Inc. has revised its original earnings report to $117.9 million, or $6.15 per share, for the year ended May 26. Earnings were previously reported at $85.1 million, or $4.44 per share. Because the Deficit Reduction Act has been signed into law, accrued income taxes related to the company's domestic international sales corporations are no longer owing.

■

Nashua Corp. reported profits for the second quarter ended June 29 of $6.2 million, or $1.31 per share, compared with $4.5 million, or 96 cents per share, for the comparable period one year earlier. Revenues were $146.1 million, compared with $140.5 million for the same period last year. Second-quarter 1983 net income included extraordinary tax credits of $1.6 million, or 35 cents per share.

■

Verbatim Corp. reported revenues of $170.8 million, up 43% from $119.8 million last year. Profits were $14.6 million, or 63 cents per share, compared with the previous year's net income of $14.2 million, or 64 cents per share. Included in the year was a $579,000 restatement of the first quarter of fiscal 1984, increasing net income to $5.4 million, or 23 cents per share, from the previously reported $4.8 million, or 21 cents per share. The restatement resulted from the recently enacted 1984 Tax Reform Act, which forgave deferred taxes.

■

Selecterm, Inc. announced revenues for the quarter ended June 30 were $6.9 million, an increase of 52% over the $4.5 million reported for the comparable period a year ago. Profits for the second quarter were $813,000, or 31 cents per share, compared with $450,000, or 18 cents per share, for the comparable period one year earlier.

■

Xidex Magnetics Corp. reported financial results for the year and quarter ended June 30. Revenues were $18.1 million for the three months, compared with $3.1 million for the comparable period a year earlier. Sales for the year ended June 30 totaled $47 million, compared with $5 million a year ago. For the year just ended, Xidex Magnetics recorded profits of $5 million, compared with a loss of $249,000 for the fiscal year ended June 30, 1983.

■

Lexidata Corp. reported revenues for the third quarter ended June 30 of $9.3 million, compared with $6.3 million for the similar period in the 1983 fiscal year. Profits were $153,000, or 3 cents per share, compared with a loss of $52,000, or 1 cent per share, one year earlier.

■

Micropro International Corp. announced it is restating its financial statements for the last six fiscal quarters in order to make the revenue recognition policies of one of its foreign subsidiaries consistent with policies employed by the rest of its consolidated group. The restatement will result in a change in earnings per share for the fiscal year ended Aug. 31, 1983, from the 42 cents previously reported to 30 cents. Earnings per share for the nine months ended May 31, 1984, will change slightly, from 57 to 56 cents per share.

■

Keane, Inc. reported profits for the second quarter ended June 30 of $145,000, or 16 cents per share, up 86% compared with $78,000, or 9 cents per share, a year ago. Revenues were $8.4 million, up 71% from $4.9 million for the quarter last year.

■

NCA Corp. announced revenues for the second quarter ended June 30 were $6.1 million, compared with $4.1 million for the same period one year earlier. Profits were $265,000, or 10 cents per share, compared with $274,000, or 10 cents per share, for the comparable quarter one year ago.

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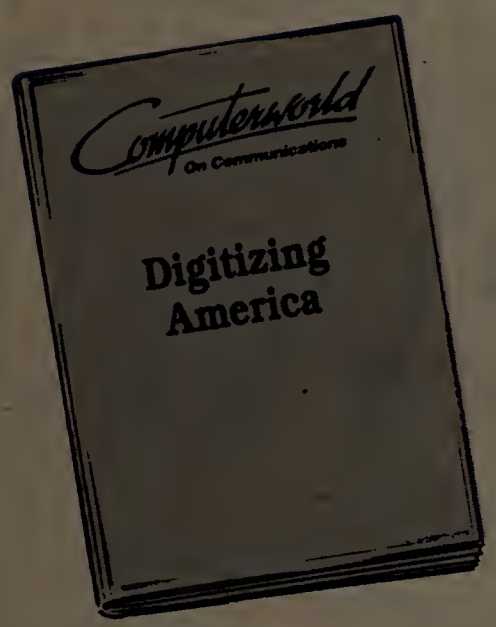
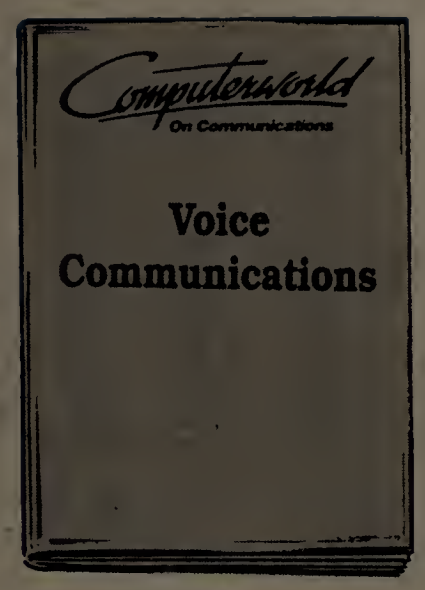


October

Communications networks are switching to all-digital. AT&T and MCI are using fiber-optic-based transmissions and satellite services. We'll explore how these changes affect users, and what the opportunities are for vendors.

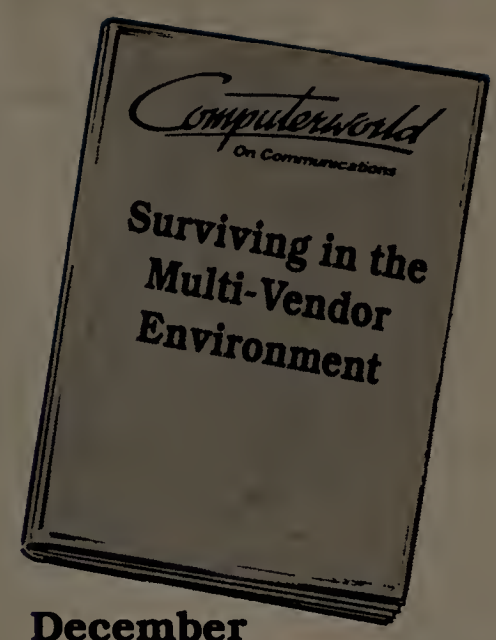
Closes August 31



November

Who uses digitized-voice store-and-forward systems? What's the latest on combining voice and data? Telephony has branched out into many sophisticated systems. We'll look at how voice communication is being integrated into the whole communications system.

Closes October 5



December

Almost a year after the AT&T breakup, users have been deluged by companies promising one-stop shopping. We'll look at the dominant vendors, offer guidance on selecting a vendor, and discuss the pros and cons of making a single-vendor commitment.

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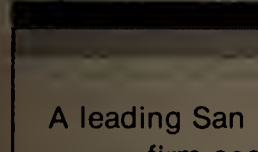

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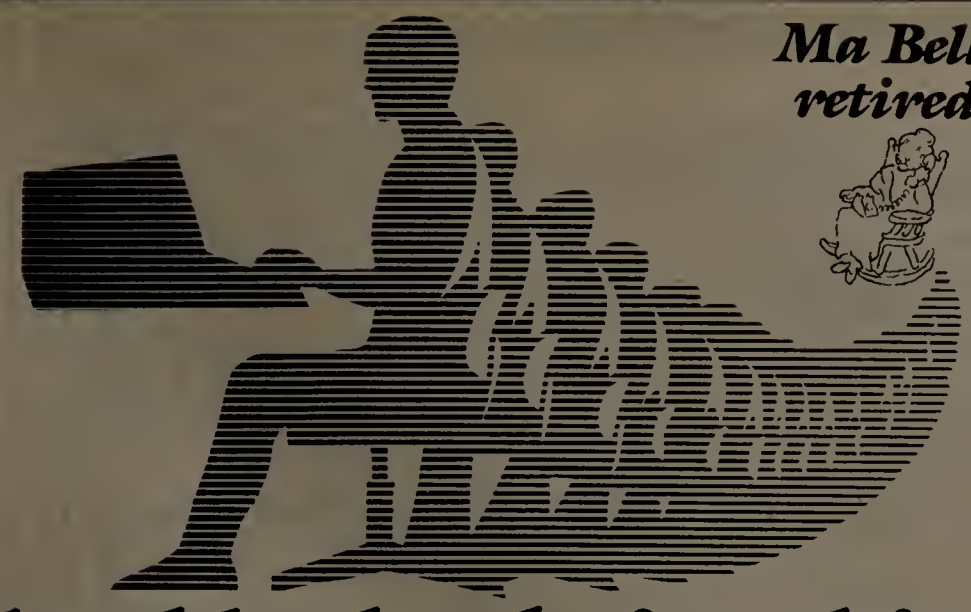

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All fees paid by client companies To be considered, contact V Stephens

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The successful candidate will be responsible for first line technical supervision of programming team and all field service management systems using Yourdan Design methodology, IDMS DB/DC on a NAS 9070 running under UM/MVS.

Requirements include a Bachelor's Degree or equivalent, and 10 years data processing experience with emphasis on field service applications, project management and IDMS DB/DC. Additionally, at least 2 years in a supervisory or management position is required.

At **ITT Courier,** we offer an excellent salary and benefits package plus career growth opportunities. Interested candidates should send resume including salary history to: **Pat Taylor, ITT Courier Terminal Systems, P.O. Box 29039, Mail Stop A12, CW393, Phoenix, AZ 85038.**

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ITT COURIER
ITT Courier Terminal Systems, a division of ITT Systems, Inc.

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The University of Tennessee-Knoxville Computing Center has an opening for a Systems Programmer/Analyst. The individual will be responsible for the design, planning, and basic technical development of IBM computer systems, programs and other data processing projects and for the coordination of functions of systems software with the data processing needs of the user community. Duties include support of MVS, JES2 and related software on an IBM 3081 and support of VM and related software on an IBM 4341.

Master's degree preferred and at least two years experience in systems programming work or an equivalent combination of education and experience. Assembler language fluency is required. Familiarity with RACF, SMP, IMS/DC, SNA or VM gens is desirable. Send resume to:

The University of Tennessee
Employment Services
804 Volunteer Blvd.
Knoxville, TN 37996

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Systems programmer to support academic and administrative computing in University environment. Systems include DECSYSTEM-2060 and 2 DECSYSTEM-2020's, all running TOPS20. VAX-11/780 installed this fall will run 4.2 BSD. Position encompasses primary responsibility for support of VAX, including training of other staff members. Bachelors degree in Computer Science and 4 years experience or a combination of experience in an advanced degree in Computer Science required. Familiarity with 4.2 BSD required; experience with TOPS20 desired. $20,904 with increase to $22,568 after 6 months. Letter of application, resume and 3 references must be on file by 8/17/84 at EO/Personnel, University of Montana, Missoula, MT, 59812.

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Phoenix firm has immediate and future positions available for experienced IMS/VS Programmer Analysts in a manufacturing environment. Programming tools needed include TSO/SPF, COBOL and structured programming methods. MRP or banking experience is highly desirable. These positions are to support large scale new development and conversion with both technical and project management growth potential for the selected candidates. Interested parties should write or call:

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EOE M/F/H

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JOB ORDER NO. 416652

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Full-time, tenure-track position available beginning September 6, 1984. Duties may include teaching Microelectronics, Data-Communications and all Computer Hardware and Software Maintenance courses.

A relevant degree is preferred but not mandatory. Hands-on technician level experience is a must for this position. Recent technical training and experience in D.E.C. and I.B.M. equipment is desirable.

Starting salary range: $16,766 to $21,872 plus up to $8,446.00 in overload, depending upon enrollment.

Call or send letter of interest requesting the application package. A completed application file will consist of a letter of intent, resume, college transcripts, 3 current letters of recommendation and Lorain County Community College Application form, all postmarked by August 24, 1984.

Incomplete files will not be considered!

Send materials to:
Dallas Garrett, Division Chairman
Engineering & Computer Technologies
Lorain County Community College
1005 North Abbe Road
Elyria, OH 44035
Telephone: (216) 365-4191 Ext: 435

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MVS SYSTEMS PROGRAMMER

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Executive Placement
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For Austin Interview, call Mr. Marcin at: (512) 472-1612 during the American Association for Artificial Intelligence Conference.

If you are unable to meet with Mr. Marcin in Austin, send your resume to: Mr. W.M. Marcin, United Technologies Research Center, Silver Lane, East Hartford, Connecticut 06108.

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For confidential consideration, please forward your resume with salary requirements to: Susan Standley, Harris Corporation, Dept. CW, 1025 W. NASA Blvd., Melbourne, FL 32919. Or for a telephone interview, please call toll free 1-800-334-0021.

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(213) 380-2681

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The Washington Metropolitan Area Transit Authority is seeking an experienced Systems Programmer for a large scale computer system. Responsibilities include maintaining the systems software for the Automatic Train Control (ATC), the bus radio system and ancillary computer systems.

REQUIREMENTS FOR CONSIDERATION:
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- FORTRAN
- ASSEMBLER
- Bachelor's Degree in Computer Science, Mathematics, Engineering or a related field

A background in/or experience with computerized power transmission control, communications and production control is desirable.
STARTING SALARY $28,930 or commensurate with experience. Please submit resume with salary history no later than August 17, 1984.

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
Office of Human Resources (Ms. Gault)
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University of Miami
Information Systems, Planning and Institutional Research
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- **DIRECTOR, TECHNICAL SUPPORT** — You will be responsible for the day-to-day hardware/software support of this leading-edge firm. Your duties will include managing quality assurance and repairs, providing general technical support, and supervising software production. You must have practical, hands-on experience in HW/SW support; 8088 and 8086 machine language environments and products; and device and microcomputer peripheral interfacing. Additionally, you must be a strong manager and have a sensitive appreciation for end-user market needs.
- **MANAGER, PRODUCT DEVELOPMENT & EVALUATION** — You will be responsible for all software selection and acquisition. In addition you will directly supervise special software development and enhancement projects, many in the 80286 environment, with major emphasis on coordinating peripheral interface efforts. You must have current hands-on 8088/8086 S/W development experience. Knowledge of synch and asynch communications, operating system design, and peripheral interfacing a must.
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COMPUTER CENTER DIRECTOR

Responsible for computer center operations, both academic and administrative computing, hardware and software selection and MIS. CAD/CAM exp. desired. M.S. in Computer/Information Science or related degree and exp. in computer facility management preferred. Salary (to mid-thirties) and rank for 12-mo. fixed-term app't dependent upon background/exp. Pos. open immediately. Send resume by 9-15-84 to: Shelby Wilsdon, Director of Personnel, Oregon Institute of Technology, Oretech Branch P.O., Klamath Falls, OR 97601. (503) 882-6321, ext. 442.

EOE

PROGRAMMER- Design, implement, code & test computer systems for administrative, financial & statistical systems. Test & enhance existing systems. 2 yrs exp or 2 yrs. related exp. - programming. Must have knowledge of Basic IV, ASSEMBLER, MACRO ASSEMBLER. Hardware is MODCOMP. $482/wk to work 40 hrs/5 days/week. Send resumes to CW-B4039, Computerworld, Box 880, Framingham, MA 01701.

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Submit resume to: **THE UNIVERSITY OF MICHIGAN, SCIL Personnel Service Center, Attn: Marjorie McRoberts, 1020 LSA Building, Ann Arbor, MI 48109-1382, REF# A054-063M-P.**

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Search and Screen Committee
For Manager, Academic Computing
c/o Director, University Computing
University of Southern Colorado
2200 North Bonforte Blvd.
Pueblo, CO 81001

AA/EOE

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Director of Programming

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Candidates must have several years experience with large data base projects, have a thorough knowledge of system hardware and software and have good organizational and communication capabilities. Preference will be given to candidates with library automation experience and a graduate degree from an American Library Association accredited library school.

The University of Iowa is a major research university. Its library system ranks 26th in volume holding among U.S. academic/research libraries. The University is a leader in innovative use of information technology with an emphasis on a community-wide information network. Iowa City is noted for a pleasant life style, an excellent education system and a full range of cultural and athletic activities.

Salary will be competitive commensurate with experience. Fringe benefits are attractive.

The position is to be filled as soon as possible. Screening of candidates will begin August 20, 1984.

Interested candidates should submit a letter of application, with a resume and at least three reference names to: **James Johnson, Director, Office of Information Technology, 101 Jessup Hall, University of Iowa, Iowa City, IA 52242.**

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Applicants should have a college or university degree in a relevant area and significant experience as a leader of a major computing operation. Experience should include the development and support of applications for administration, education and research. Familiarity with computing services in a university is desirable. A thorough working knowledge of state-of-the-art hardware and software technologies is required. In choosing a candidate, the Search Committee will look for evidence of leadership and planning ability, technical knowledge, and management and inter-personal skills.

Send nominations and applications to:

Maurice Glicksman
Provost and Dean of the Faculty
Box 1945
Brown University
Providence, RI 02912

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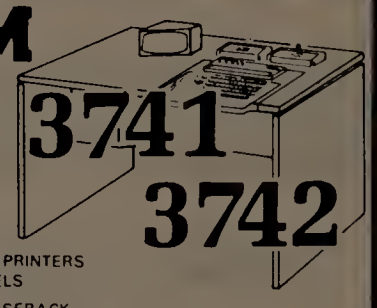
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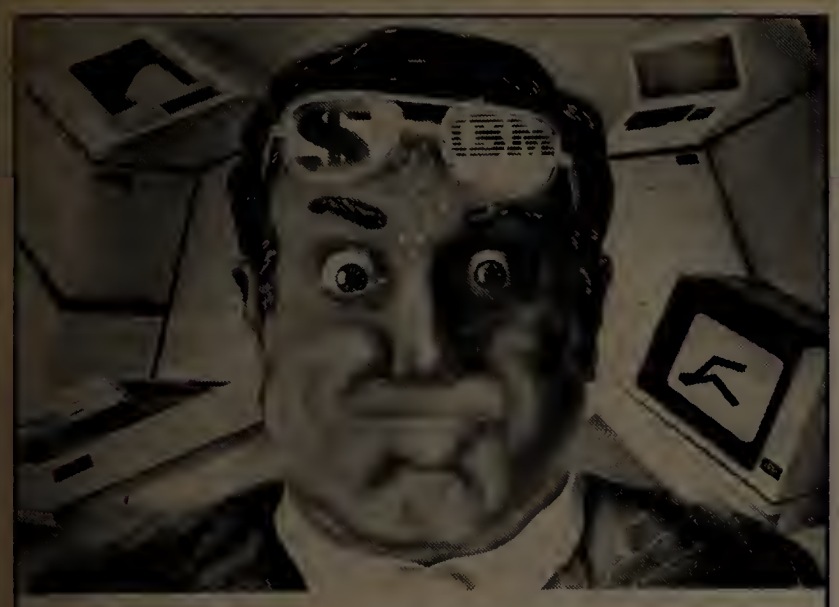

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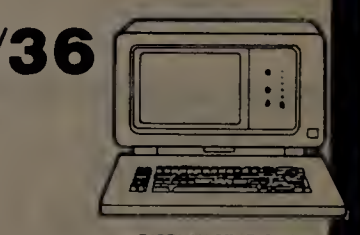

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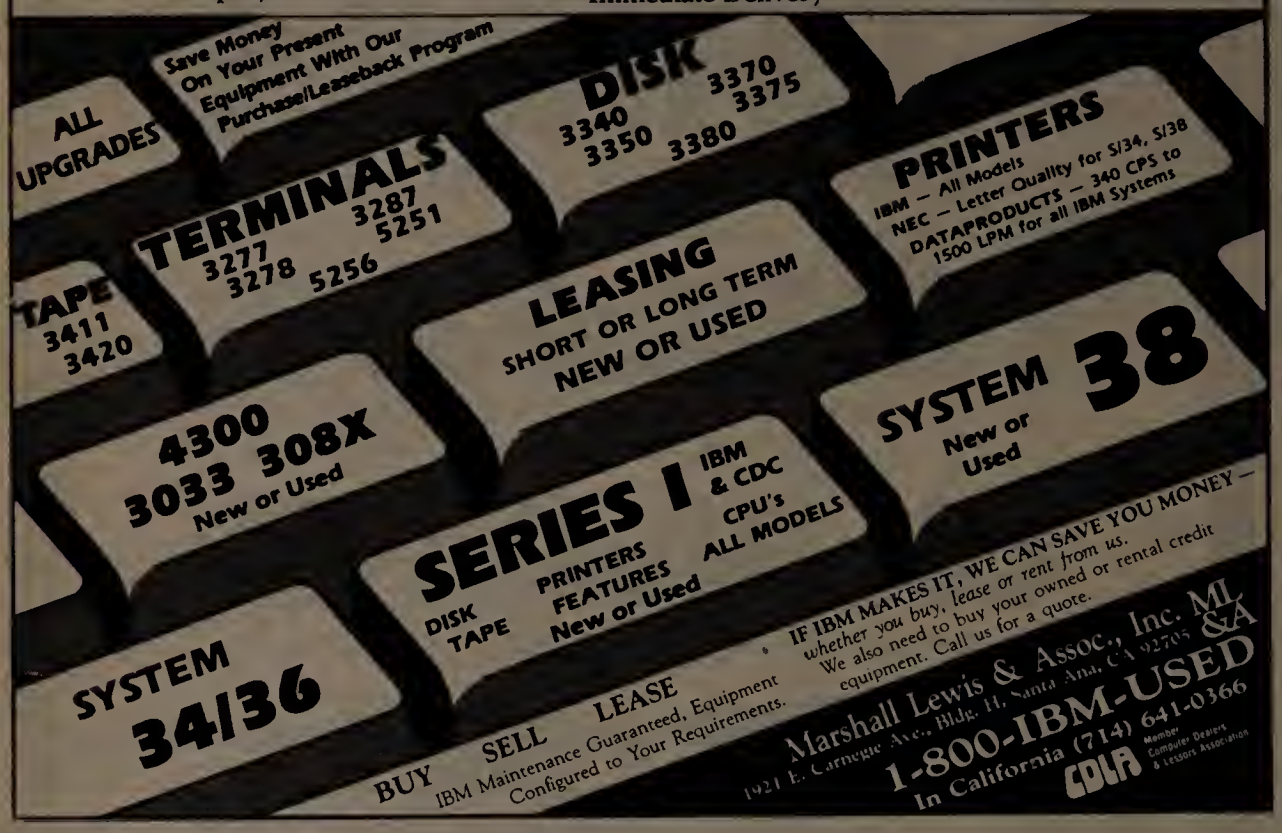

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Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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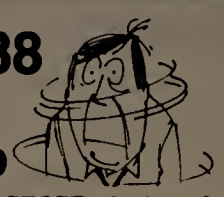

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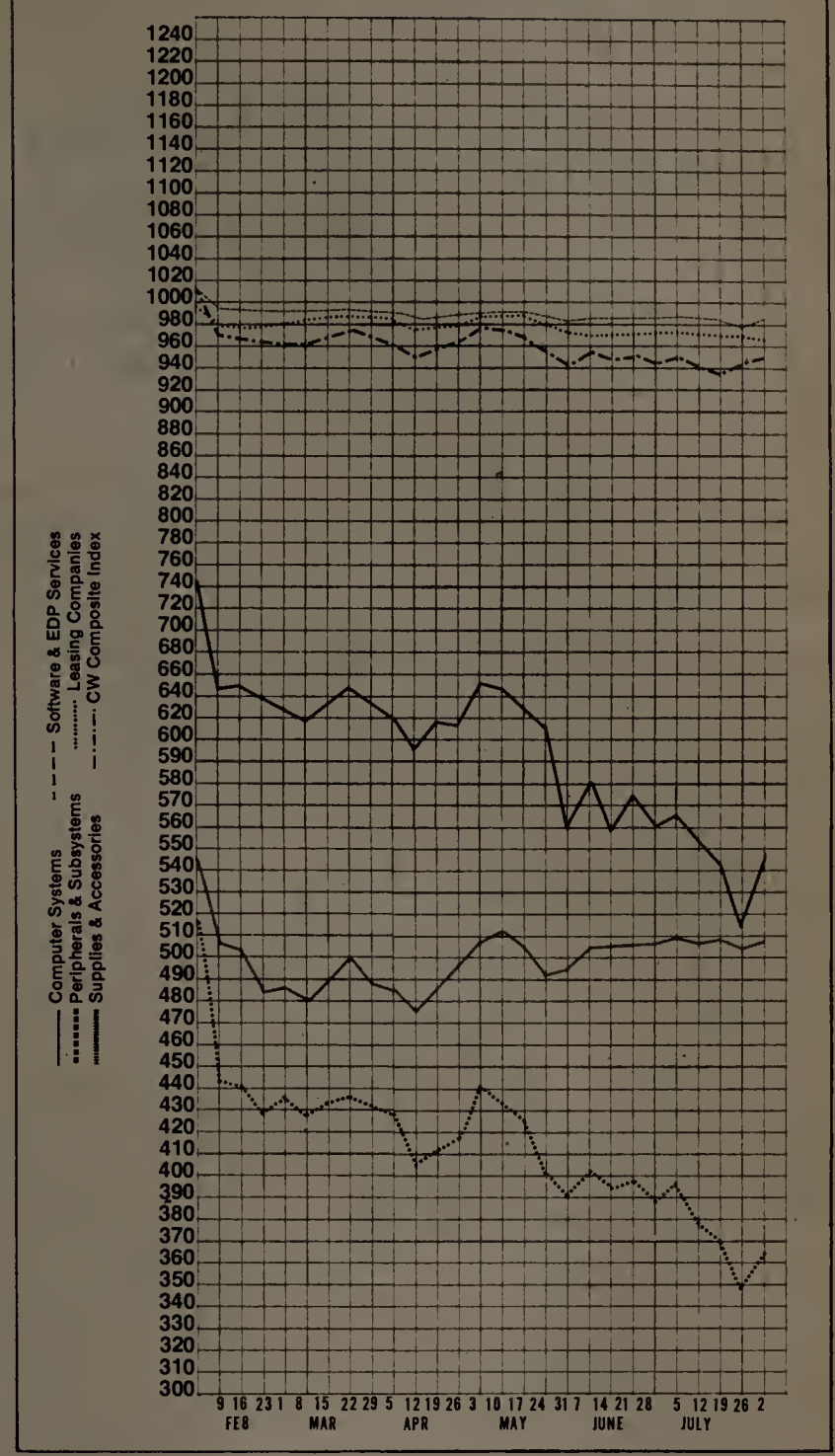

Computerworld Stock Trading Summary

TRADE QUOTES

CLOSING PRICES WEDNESDAY, AUGUST 1, 1984

All statistics compiled, computed and formatted by TRADE QUOTES, INC Cambridge, Mass. 02139

EXCH		1983-84 RANGE (1)	CLOSE AUG 1 1984	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
O	ALPHA MICROSYSTEMS	5- 24	8 1/4	+ 1/2	+5.7
O	ALTOS COMPUTER SYST	8- 21	8 7/8	- 1/8	-1.3
A	AMDAHL CORP	10- 30	10 1/2	+ 3/4	+7.6
O	APPLE COMPUTER INC	18- 63	25	-1 3/4	-8.5
N	AT&T	15- 21	17 7/8	- 1/4	-1.3
N	BURROUGHS CORP	44- 58	53 7/8	+4 1/4	+8.5
O	COMPUTER AUTOMATION	3- 17	5	+ 1/8	+2.5
A	COMPUTER CONSOLES	14- 26	15	-1 1/4	-7.8
N	CONTROL DATA CORP	25- 62	28 3/4	+1 1/2	+5.9
O	CONVERGENT TECHNOL	10- 41	13 1/4	+3	+29.2
N	CRAY RESEARCH INC	39- 58	47 5/8	+4 3/4	+11.0
N	DATA GENERAL CORP	27- 49	46 1/2	+6	+14.8
N	DATAPOINT CORP	16- 31	19 3/8	+3 3/8	+21.0
N	DIGITAL EQUIPMENT	64-125	87 3/8	+8 1/4	+11.8
A	EECO INC	12- 16	13 3/8	- 1/4	-1.8
N	ELECTRONIC ASSOC.	3- 15	3	0	0.0
N	FLOATING POINT SYST	13- 44	16 1/8	- 1/4	-1.5
N	FOXBORO	28- 47	27 5/8	-2 3/8	-7.9
O	GENERAL AUTOMATION	7- 16	8 1/4	+ 7/8	+11.8
N	GOULD INC	24- 44	25 7/8	+ 1/2	+1.8
N	HARRIS CORP	23- 48	26 3/8	+1 1/2	+8.0
N	HEWLETT-PACKARD CO	31- 48	37 7/8	+3	+8.8
N	HONEYWELL INC	48- 69	55 1/2	+4 3/4	+8.3
N	IBM	103-134	112 7/8	+5 3/4	+5.3
O	IPL SYSTEMS INC	3- 14	3 3/8	+ 3/8	+12.5
N	M/A-COM INC	13- 35	18 3/4	+1 1/2	+8.8
N	MANAGEMENT ASSIST	8- 28	24 3/8	0	0.0
N	MATSUSHITA ELEC(ADR)	60- 88	62 3/4	+1 7/8	+3.0
N	MODULAR COMPUTER SYS	6- 18	8	+ 7/8	+12.2
N	MOHAWK DATA SCI	8- 17	12 3/4	+ 3/4	+6.2
N	MOTOROLA INC	29- 49	36 1/4	+2 7/8	+8.8
N	NAT'L SEMICONDUCTOR	11- 20	20 1/2	+2	+10.0
N	NBI INC	17- 38	18 1/4	+ 1/2	+2.8
N	NCR	21- 34	24 1/8	+3 1/8	+14.8
N	PERKIN-ELMER	18- 37	18 3/8	+1 1/8	+8.1
N	PRIME COMPUTER INC	11- 26	15 1/2	+1 3/4	+12.7
N	SPERRY CORP	35- 50	37 7/8	+2 5/8	+7.4
O	TANDEM COMPUTERS INC	15- 40	15	-1 5/8	-9.7
N	TANDY CORP	25- 62	27 1/4	+1 1/4	+4.8
O	TELEVIDEO SYSTEMS	4- 41	4 3/8	+ 1/2	+12.8
O	TELXON CORP	8- 18	10 1/2	0	0.0
N	TEXAS INSTRUMENTS	101-169	122 7/8	+7 5/8	+6.8
A	ULTIMATE CORP	15- 24	20	+2 3/4	+15.8
O	VECTOR GRAPHICS INC	1- 8	3/4	0	0.0
A	WANG LABS "B"	24- 42	28 1/4	+2 3/4	+11.7
A	WANG LABS "C"	24- 42	28 1/2	+2 7/8	+12.1
N	XEROX CORP	35- 52	35 3/8	- 1/8	-0.3
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	10- 21	20	+ 1/2	+2.5
N	COMDISCO INC	10- 42	11 5/8	+ 7/8	+8.1
O	CONTINENTAL INFO SYS	5- 18	4 7/8	- 1/8	-2.5
N	DPF INC	10- 15	11 5/8	+ 1/8	+1.0
O	PHOENIX AMERICAN INC	8- 17	5 1/2	- 3/4	-12.0
O	SELECTERM INC	11- 21	12	- 1/2	-4.0
N	U.S. LEASING	28- 44	30	+ 1/4	+0.8
	COMPONENTS				
N	ADVANCED MICRO DEV	25- 37	30 5/8	+3 3/4	+13.9
O	ADV'D SEMICONDUCTOR	16- 38	20 1/4	+4 1/4	+26.5
N	ANALOG DEVICES INC	20- 32	23 1/4	+1 5/8	+7.5
O	ANALOGIC CORP	10- 31	10 3/4	+ 3/4	+7.5
N	APPLIED MAGNETICS CP	8- 37	9 5/8	- 1/4	-2.5
N	TERADYNE	23- 38	27 1/8	+4 5/8	+20.5

EXCH		1983-84 RANGE (1)	CLOSE AUG 1 1984	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	3- 8	3 1/4	0	0.0
N	ADVANCED SYSTEMS INC	14- 22	16 1/2	+1 3/4	+11.8
O	AGS COMPUTERS INC	11- 32	13 1/2	+3	+28.5
O	AMERICAN SOFTWARE	13- 31	12 3/4	+ 1/8	+0.9
N	ANACOMP INC	2- 19	2 1/8	- 1/8	-5.5
O	ANALYSTS INTL CORP	5- 17	5 1/4	0	0.0
A	ANSWERED DATA RES.	18- 37	18 3/8	+1	+5.4
O	ASK COMPUTER SYSTEMS	13- 21	17 5/8	+1 5/8	+10.1
B	ASTRADYNE COMP IND	1- 7	2 1/8	+ 1/4	+13.3
N	AUTOMATIC DATA PROC	30- 44	35 1/4	- 1/4	-0.7
O	CGA COMPUTER ASSOC	9- 17	12 1/4	+ 1/4	+2.0
O	COMPUTER ASSOC INT'L	15- 35	17 3/4	+2	+12.6
O	COMPUTER HORIZONS	8- 20	5 1/2	- 1/4	-4.3
O	COMPUTER NETWORK	5- 11	5 1/4	0	0.0
N	COMPUTER SCIENCES	11- 23	12 3/8	+ 7/8	+7.6
O	COMPUTER TASK GROUP	12- 18	14 1/4	0	0.0
O	COMPUTER USAGE	6- 18	10 7/8	+2 7/8	+35.5
O	COMPUTONE SYSTEMS	4- 23	4 5/8	+ 7/8	+23.3
O	COMSERV CORP	1- 16	3	+1 3/4	+140.0
O	COMSHARE	7- 14	7	- 1/2	-6.6
N	CULLINET SOFTWARE	24- 50	37 1/4	+2 1/8	+6.0
O	CYCARE SYSTEMS INC	18- 25	18 1/2	- 1/4	-1.3
N	ELECTRONIC DATA SYST	25- 44	43 7/8	+ 1/4	+0.5
O	HOGAN SYSTEM INC	10- 27	11 1/4	+1 1/4	+12.5
N	GENERAL ELECTRIC CO	45- 58	53 3/8	+3 7/8	+7.8
N	OTE CORP	36- 48	37 3/4	0	0.0
N	INFORMATICS INC	15- 32	15 7/8	- 1/8	-0.7
O	INFORMATION SCIENCE	3- 17	4 3/4	- 1/4	-5.0
O	INFOTRON SYSTEMS CP	24- 43	26 1/2	+2 1/4	+9.2
O	KEANE ASSOCIATES	6- 15	9 1/2	- 1/4	-2.5
A	LOGICON	18- 31	23 1/2	+ 3/8	+1.6
O	MCI COMMUNICATIONS	6- 28	6 7/8	+ 1/2	+7.8
O	MNGT SCI AMER INC	11- 33	11 1/2	+ 3/4	+6.9
O	MATHEMATICAL APP GRP	6- 18	7	0	0.0
O	MICOM SYSTEMS INC	31- 50	35 3/4	+1 3/4	+5.1
O	MONCHIX-WEBER CP	6- 22	8 3/4	+ 5/8	+7.8
O	NATIONAL DATA CORP	14- 26	14 1/4	- 3/4	-5.0
O	ON-LINE SOFTWARE INT	8- 29	9	- 1/2	-5.2
O	PANSOPHIC SYSTEMS	11- 30	13 1/4	+ 1/2	+3.9
N	PLANNING RESEARCH	12- 21	12 3/4	+1	+8.5
O	POLICY MGMT SYSTS CP	22- 35	26 3/4	+2 3/4	+11.4
O	PROGRAMMING & SYS	4- 8	4 5/8	0	0.0
O	REYNOLDS & REYNOLD	28- 53	30	+2	+7.1
O	SEI CORP	13- 34	14	+ 1/2	+3.7
O	SHARED MEDICAL SYST	23- 43	25 5/8	+2 1/8	+8.0
O	SCIENTIFIC COMPUTERS	8- 14	9	+ 1/2	+5.8
O	SOFTWARE AG	9- 14	10 1/2	+ 3/8	+3.7
N	UNIS CORP	10- 18	10 1/2	+ 1/8	+1.2
N	UCCEL	7- 17	8 1/4	0	0.0
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	2- 7	2 5/8	- 1/8	-4.5
A	ANDERSON JACOBSON	7- 26	8	- 1/2	-5.8
O	AUTO-TROL TECHNOLOGY	10- 28	9 5/8	-1 1/2	-13.4
O	AVANT-GARDE COMPUTNG	15- 29	19 1/2	+2 1/4	+13.0
O	BANCTEC INC	6- 22	8	- 3/4	-11.1
A	BEEHIVE INT'L	2- 15	2 1/4	0	0.0
N	BOLT,BERANEK & NEW	17- 30	18 3/4	+2 1/8	+12.7
O	CAMBEX CORP	1- 3	1 1/4	+ 1/8	+10.5
N	CENTRONICS DATA COMP	8- 28	8 1/8	- 7/8	-9.7
A	CETEC CORP	7- 12	7 1/4	- 3/8	-4.9
A	COGNITRONICS	4- 20	4 3/8	- 1/4	-5.4

EXCH		1983-84 RANGE (1)	CLOSE AUG 1 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMPUTER DEVICES INC	1- 1	3/4	+ 1/4	+50.0
O	COMPUTER TRANSCEIVER	2- 10	1 3/4	- 1/4	-12.5
N	COMPUTERVISION CORP	29- 53	38	+3 1/4	+9.3
N	CONRAC CORP	11- 24	14 3/8	+1 1/2	+11.6
A	DATAPRODUCTS CORP	16- 32	17 3/8	+1 3/8	+8.5
A	DATARAM CORP	7- 12	7	- 3/8	-5.0
O	DATA SWITCH CORP	6- 41	5 3/4	- 1/4	-4.1
O	DATUM INC	6- 17	5 3/4	0	0.0
O	DECISION DATA COMPUT	8- 16	8 3/4	+ 1/8	+1.2
O	DOCUTEL-OLIVETTI	7- 39	7 3/8	- 1/8	-1.8
N	ELECTRONIC M & M	5- 11	8 1/4	+ 5/8	+11.1
O	ENDATA, INC	8- 16	8 1/4	- 1/4	-2.9
O	EVANS & SUTHERLAND	13- 50	17 5/8	+4 3/8	+33.0
O	GANDALF TECHNOLOGIES	8- 13	10 5/8	+ 1/8	+1.1
N	GEN'L DATA COMM IND	10- 17	14	0	0.0
O	GREAT SOUTHWEST IND	1- 3	1/2	0	0.0
N	HAZELTINE CORP	16- 31	26 3/4	+2 1/4	+9.1
O	ICOT CORP	3- 8	3 5/8	+ 1/4	+7.4
O	INFORMATION INTL INC	10- 15	10 3/4	+ 1/2	+4.8
O	INTEL CORP	27- 45	31 1/2	+4 1/2	+16.6
O	IPL SYSTEMS INC	3- 14	3 3/8	+ 3/8	+12.5
A	LUNDY ELECTRONICS	7- 19	8 7/8	0	0.0
O	MEGADATA CORP	8- 15	11 3/4	+ 1/4	+2.1
A	MSI DATA CORP	10- 25	10 1/8	+ 3/8	+3.8
N	NASHUA CORP	18- 29	24 3/8	+ 1/4	+1.0
O	NETWORK SYSTEMS CORP	16- 34	23 1/4	+3 3/8	+16.9
N	NO AMERICAN PHILIPS	30- 40	33 3/4	+2 1/2	+8.0
N	NORTHERN TELECOM LTD	30- 49	38 3/4	+4 3/4	+13.9
O	OMEX	1- 6	1/4	- 1/8	-33.3
N	PARADYNE CORP	12- 26	13 1/2	+1 3/4	+14.8
A	PENRIL CORP	9- 14	12 1/2	+1 1/8	+9.8
O	PHOENIX AMERICAN INC	6- 17	5 1/2	- 3/4	-12.0
N	PLESSEY CO (ADR)	25- 41	25 5/8	+1 1/8	+4.5
O	PRINTRONIX INC	16- 34	19 1/4	+3 1/4	+20.3
O	RAMTEK CORP	6- 23	6 1/4	-1	-13.7
N	RECOGNITION EQUIP	10- 17	10 5/8	+ 7/8	+8.9
N	ROLM CORP	30- 80	41 7/8	+3 1/4	+8.4
N	SANDERS ASSOCIATES	36-120	44 1/4	+5 1/4	+13.4
O	SCAN DATA	1- 3	3/8	0	0.0
O	SCAN-TRON CORP	9- 19	9 1/4	+ 1/2	+5.7
N	SCIENTIFIC ATLANTA	8- 23	8 1/8	+ 1/2	+6.5
N	STORAGE TECHNOLOGY	7- 23	8 1/4	+ 7/8	+11.8
O	SYKES DATATRONICS	2- 13	2 1/2	+ 1/4	+11.1
O	SYSTEMS & COMP TECH	20- 38	26	+2 1/2	+10.6
A	T BAR INC	7- 17	8 3/4	- 3/8	-4.1
A	TAB PRODUCTS CO	13- 20	14 1/2	+ 7/8	+6.4
O	TANDON CORP	7- 35	8 1/8	+ 1/8	+1.5
A	TEC INC	8- 12	11	+1 1/2	+15.7
N	TEKTRONIX INC	52- 87	56 1/2	+4 3/4	+9.1
N	TELEX	19- 32	29 3/4	+3 1/8	+11.7
O	TESDATA SYSTEMS CP	3- 17	2 5/8	+ 1/8	+5.0
N	TIMEPLEX INC	13- 23	15 1/4	+2 1/8	+16.1
O	VISUAL TECHNOLOGY	9- 26	8 1/2	- 1/4	-2.8
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	17- 23	21	+ 1/4	+1.2
N	BARRY WRIGHT	22- 33	27 1/4	+ 1/4	+0.9
A	DUPLEX PRODUCTS INC	22- 27	23 1/4	0	0.0
N	ENNIS BUS. FORMS	18- 28	18 3/4	- 1/4	-1.3
N	3M COMPANY	69- 90	76 3/4	+1 1/8	+1.4
N	MOORE CORP LTD	35- 51	35	+1	+2.6
O	STANDARD REGISTER	27- 35	33 1/2	+ 1/4	+0.7
N	WALLACE COMP SERVICE	23- 33	26 5/8	+ 1/8	+0.4

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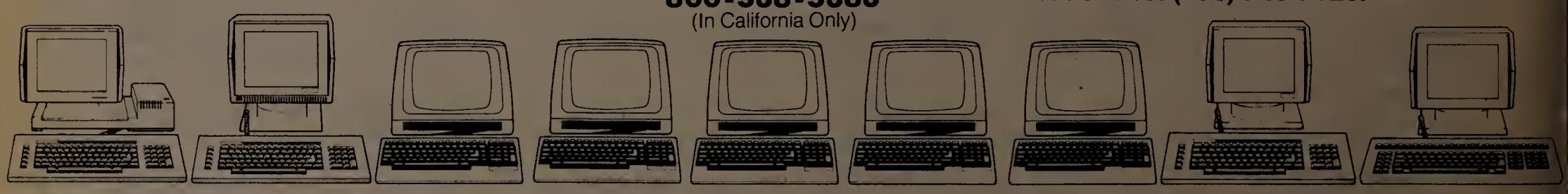

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